

NETWORK WORLD

The Newsweekly of Enterprise Network Strategies

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ATM switch opens new LAN vistas

By Jim Duffy
Senior Editor

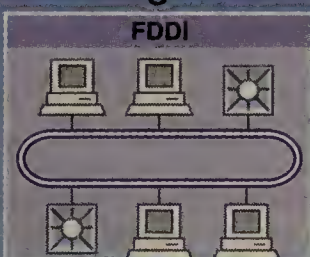
NEW YORK — Citing user requirements for high-performance LANs for voice, data and video, Adaptive Corp. last week unveiled an Asynchronous Transfer Mode (ATM) switch it claims will overcome bottlenecks in current shared-media LANs.

The ATM switch, called ATMX, has a 1.2G bit/sec backplane and 15 interface slots. Each interface has six 100M bit/sec full-duplex ports for attaching workstations and internetworking devices over multimode fiber-optic media. Fully loaded, the switch supports 90 ports.

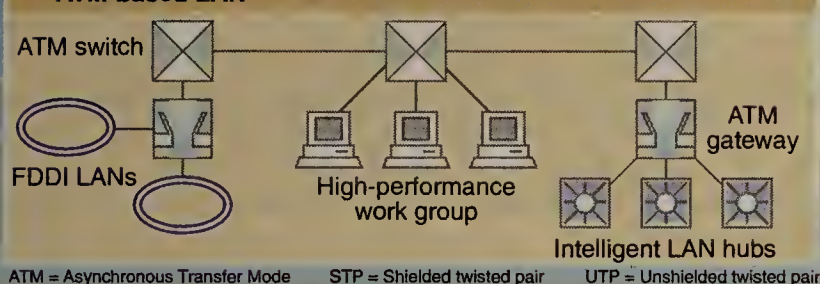
Adaptive, a subsidiary of Network Equipment Technologies, Inc., introduced the ATMX here at investment firm Bear, Stearns & Company, Inc., a beta user of the switch. Adaptive officials proclaimed the switch would end performance bottlenecks inherent in today's local-area network internetworks and high-speed LANs, such as Fiber Distributed Data Interface nets.

"We're divorcing the speed of
(continued on page 47)

ATM to challenge FDDI



ATM-based LAN



ATM = Asynchronous Transfer Mode STP = Shielded twisted pair UTP = Unshielded twisted pair

	FDDI	ATM
Foundation technology	Token passing, shared ring	Cell relay, switch-based
Wire speed	100M bit/sec	Up to 195M bit/sec
Throughput	20M-30M bit/sec	Up to 195M bit/sec
Backbone media	Single or multimode fiber	Multimode fiber
Hub-to-desktop media	Single or multimode fiber, STP or UTP	Multimode fiber (STP in future)
Traffic supported	Data, image, video	Voice, data, image, video
Availability	Today	This fall

ATM threatens to usurp FDDI as backbone choice

By Skip MacAskill
Staff Writer

Long touted as the next-generation local-area network, FDDI may be leapfrogged by Asynchronous Transfer Mode (ATM).

Although ATM technology is still evolving, industry observers believe it will not only surpass Fiber Distributed Data Interface but will also obviate the development of FDDI-2, an emerging ANSI specification designed to simultaneously handle voice, video and data.

"I don't think FDDI has a ghost of a chance at being successful," said Tom Nolle, president of CIMI Corp., a consulting and research firm in Voorhees, N.J. "A good premises ATM strategy could totally eclipse FDDI to the point that it would be suicidal for a user to implement it."

Michael Howard, president of Infonetics Research, Inc., a consultancy in San Jose, Calif., believes there may be a market for FDDI, but ATM will ultimately rel-
(continued on page 51)

Hermes to deliver Windows mgmt. tools

Microsoft previews software to manage Windows clients in LAN Manager for Windows NT nets.

By Margie Wylie
Senior Editor

SAN FRANCISCO — The winged-foot Greek messenger god last week took on a new ward when Microsoft Corp. previewed software code-named Hermes that will let administrators manage Windows desktops as never before.

Due in mid-1993, the software will run on an IBM LAN Manager for Windows NT server and let managers shape the desktop environments of Windows and Windows NT users. Hermes will let managers inventory the hardware and software on Windows workstations, remotely install software and control application usage.

"This is a different approach to management than others have taken. It centers more on applications on the network and on workstation configuration [than the network itself]," said Jodi Mardesich, a San Francisco-based analyst with The Burton Group. "It isn't going to compete with SunNet Manager."

It might, however, compete with an OS/2-based scheme for software distribution and node configuration that IBM previewed earlier this month.

IBM's program will load soft-
(continued on page 49)

FEATURES



BUYER'S GUIDE

■ Vendors step up intelligence of LAN backup programs. Page 33.

User resolves AppleTalk routing woes

By Maureen Molloy
Senior Writer

NEW YORK — In building an internetwork linking eight diverse LANs, Time, Inc. Magazines found ways to resolve some nagging problems users have long faced in routing AppleTalk.

Through the use of Wellfleet Communications, Inc. routers equipped with Apple Computer, Inc. AppleTalk filtering capabilities, the organization has witnessed an exponential increase in the efficiency of its network.

"From a work flow point of view, our editorial staff now has much greater and smoother access to information," said Lynn Crimando, Time Magazines' director of editorial operations. "The routers open up a whole world to end users and, at the same time, the filters shelter
(continued on page 51)

European carriers unite in continental network effort

BT, France Telecom among partners in GEN team.

By Bob Wallace
Senior Editor

Five European carriers last week announced plans to build a jointly owned pan-European data network that will enable users to more easily link far-flung locations.

British Telecom International, Inc., France Telecom, Spain's Compania Telefonica Nacional de Espana, Germany's Deutsche Bundespost Telekom and Italy's Asst/Stet will together build a fiber-based network called the Global European Network (GEN).

The carriers hope to reduce private-line provisioning inter-

vals and offer users high-quality dedicated digital links in place of analog private lines.

"The analog private lines available today are low-quality and don't always meet users' needs," said Philippe Saint-Hilaire, France Telecom's director of international operations. "And provisioning private lines between countries can take as long as 100 days because of the coordination needed between PTTs and limited available network capacity."

The carriers hope to be able to provision 2.048M bit/sec E-1 and fractional E-1 services in as little
(continued on page 4)

NETLINE



PUBLIC NET OUTAGES may be on the rise, according to a recent Network Reliability Council report. Page 2.

INTERNET UPGRADE will be topic of debate at IETF meeting this week. Page 2.

NEW NET/CMD release will lighten net managers' load by automatically handling network problems. Page 2.

E-MAIL GROUP AGREES to develop a standard messaging API. Page 4.

IBM OFFERING lends a hand to help desks. Page 4.

DEC OPENS UP with enhancements to VMS. Page 4.

MICROSOFT TALKS ABOUT net features of upcoming Cairo operating system. Page 49.

Report details public net outages over last quarter

FCC Network Reliability Council study indicates major network problems may be on the increase.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The FCC's Network Reliability Council (NRC) last week released a report indicating that the frequency of major network outages may be increasing.

While the report showed local and long-distance carriers had 37 outages in the last 86 days, George Barletta, chairman of the NRC's Threshold Reporting Group and vice-president of operations services at Nynex Corp., said the number of outages was in line with NRC expectations.

However, a disturbing trend

appears when these results are compared with a report submitted to both the Federal Communications Commission and Congress earlier this year by the Telecommunications Association, Inc. (TCA). The TCA report, which covered the last three quarters of 1991, revealed six central office switch outages affecting 50,000 lines or more.

Of the 37 outages covered by the NRC report, four were switch failures knocking out service to 50,000 or more customers and one knocked out service to 39,000 lines at a site deemed

(continued on page 50)

IETF to debate NSF plan to upgrade Internet backbone

Part of proposal involves new routing scheme.

By Ellen Messmer
Washington Correspondent

CAMBRIDGE, Mass. — The National Science Foundation's (NSF) proposal to upgrade the T-3 Internet backbone to 155M bit/sec facilities and migrate to a separate routing scheme will be debated at this week's Internet Engineering Task Force (IETF) meeting here.

NSF is proposing a new two-tiered system in which network routing would be performed by one contractor called the Routing Authority, while a second contractor would provide 155M bit/sec transport services.

Today, the T-3 NSF backbone services are supplied by Advanced Network & Services, Inc. (ANS) in cooperation with Merit, Inc., whose five-year NSF contract expires at the end of October. An 18-month contract extension is envisioned by NSF, which is behind schedule in issuing a solicitation for the new Internet backbone.

In a draft solicitation released a few weeks ago and open to public comment until Aug. 3, NSF surprised many by backing off from an earlier idea to have the new NSF Network (NSFNET) supplied

(continued on page 50)

Boole & Babbage automates Net/Command platform

By Michael Cooney
Senior Editor

SUNNYVALE, Calif. — On July 22, Boole & Babbage, Inc. will announce enhancements to its Net/Command that will enable the integrated network management system to automatically respond to network problems.

Analysts said the new version of Net/Command will be able to automatically reset modems and other network equipment or dial out to a vendor for service, among other things. The company is also expected to add configuration and scheduling management features to the platform.

The announcement will follow the introduction of a new architecture for the mainframe-based Boole & Babbage Intercommunication Facility Release 3 (BBI-3) that the company and other developers can use to write distributed management applications that feed data to a central host. BBI-3 will initially support applications running on MVS and OS/2 machines.

The company will also introduce an MVS application monitoring tool and an enhanced version of its Net/Avail Systems Network Architecture monitoring software

(continued on page 50)

Briefs

MCI takes page from AT&T book on frame relay. Following AT&T's lead, MCI Communications Corp. has announced it will price its Virtual Private Data Service frame relay offering on a customer-specific contract basis. AT&T last November said it would not file tariffs for its InterSpan frame relay service. Sprint Corp. is the only Big Three carrier that has filed a public frame relay service tariff.

Firm to resell IBM terminal controller. CTI Datacom, Inc. of Montreal last week became the first company to license IBM's 3174 Establishment Controller and the second to license the 3172 Interconnect Controller to resell under its own label. AT&T Paradyne was the first company to resell the 3172. CTI, a manufacturer of IBM-compatible 3270 terminals, also resells McDATA Corp. controllers.

IBM dresses for retail. IBM's Integrated Systems Solutions Corp. last week signed an accord with Federated Department Stores, Inc. under which IBM will market retail applications and technology developed by Federated's Sabre Group information systems division.

Innkeeper signs up MCI. Holiday Inn Worldwide last week awarded MCI Communications Corp. a three-year, \$36 million contract for Virtual Network (Vnet), 800, teleconferencing and operator services. MCI will build the company a Vnet linking 400 Holiday Inn hotel locations, eight regional offices and the company's corporate headquarters in Atlanta.

RBHC lets fewer go than anticipated. Bell Atlantic Corp. last week said it will eliminate 3,450 telephone company staff jobs by year end, down from the 4,000 to 6,000 jobs originally estimated last April. The company said it has cut 12,000 management and hourly employees since 1984. The carrier currently employs 75,700 workers.

Mini maker launches fiber bazooka. Hewlett-Packard Co. last week introduced a chipset designed for high-speed point-to-point fiber-optic links supporting speeds up to 1.5G bit/sec. The HDMP-1000 chipset consists of a transmitter and receiver that can support transmissions over fiber at distances up to 10 km. The chipset, which is available now, can be used in switches, bridges, routers and other devices that need high-speed point-to-point connections.

PCs get ISDN view. Teleos Communications, Inc. and NCR Corp. last week separately announced Integrated Services Digital Network terminal adapter cards for personal computers. The \$1,395 Teleos PC Terminal Adapter/Series 102, available next month, provides a Basic Rate Interface and supports the Transmission Control Protocol/Internet Protocol through a packet driver. NCR's PC Terminal Adapter line includes four boards, which start at \$1,150. Two of the adapters support both voice and data, while the others support data only. All are available now.

DEC lands down under. Digital Equipment Corp. has won a 10-year, \$750 million contract to develop an operational support system for Optus Communications, the second largest telecommunications carrier in Australia. DEC will serve as the project's prime contractor and will be responsible for systems integration, management and training. DEC said this is the largest systems integration and services deal it has won to date.

CONTENTS

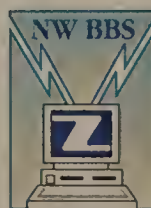
Data Net Architectures	7
IBM changes rules for defining 3270s.	
NCR expands abilities of its management system.	
Local Networking	9
IBM to add support for fiber to desktop.	
AppleTalk file server has PC price, Quadra 950 speed.	
Internetworks	13
OSPF: Addressing RIP's shortcomings.	
Star-Tek enhances software with an error-detection feature.	
Global Services	15
Nynex details public frame relay strategy.	
Resellers batten hatches for battle against AT&T.	
Enterprise Applications	19
User downsizes in an off-the-shelf way.	
HP bolsters Allbase features.	
Industry Update	25
UN seeks backers for export trade centers.	
Makers of inverse muxes make interoperability push.	
Management Strategies	29
The art of negotiating in recessionary times.	
New technology wins votes at convention.	
Opinions	30
Features	33
Action Center	40
Networking Marketplace	46

CONTACTS



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E-mail group to develop common API

By Bob Brown
Senior Editor

MOUNTAIN VIEW, Calif. — Responding to growing user demand, the X.400 Application Program Interface Association (XAPIA) last week said it has devised a plan for developing a single standard messaging API.

XAPIA, an electronic mail vendor consortium here that has worked to develop APIs for X.400 nets, outlined a three-pronged approach to providing a common API. It will first define a basic no-frills API, then seek user input on a more complete standard. Based on that input, XAPIA will develop a broader proposal and release it

for comment at an annual E-mail trade show this fall.

Messaging APIs are sets of function calls that developers can use to write mail-enabled applications. The emergence of multiple APIs from rival vendor camps in recent months has raised interoperability concerns among users and confusion among application developers. As a result, users and developers have put pressure on vendors to agree on a common messaging API.

Last month, Microsoft Corp. asked XAPIA to broaden its charter to coordinate creation of a common messaging API. Microsoft also pitched its own Messaging API (MAPI) for consideration as the standard and encouraged supporters of other messaging APIs to do the same.

According to Steve Farowich, director of service delivery for Digital Equipment Corp.'s messaging practice in Bellevue, (continued on page 49)

New IBM product helps automate net help desks

By Michael Cooney
Senior Editor

WHITE PLAINS, N.Y. — IBM last week announced a help desk product that automatically sends trouble tickets to any vendor's problem reporting system.

IBM's Problem Management Bridge/MVS (PMB) promises to reduce downtime by speeding vendor response to net problems and to cut spending on operations staff, among other things.

PMB includes OS/2-based software that runs on an unattended Personal System/2 linked to an MVS mainframe; software that runs with IBM's Information/Management database on the host; and interface modules that provide the link to IBM's service center or any other vendor's service management system.

PMB monitors the Information/Management database and

gathers data needed to draft a trouble ticket. It automatically dials out to any vendor's service or management system and transmits the trouble ticket, without operator intervention. The vendor's system can dial back to PMB to update it on the status of the trouble ticket.

The key to PMB's success will be getting other vendors to write the interface modules necessary for the bridge to work with their management systems. IBM's Electronic Customer Interface (ECI) to its Network Service Support (NSS) Center will be the only module initially available for PMB. Other vendors can write an interface to any of the protocols OS/2 supports, such as 3270 and LU 6.2. The ECI also supports all of the protocols supported in OS/2.

(continued on page 49)

Carriers unite in network effort

continued from page 1

as an hour, Saint-Hilaire said. E-1 links, the international equivalent of T-1, support 30 64K bit/sec channels.

The GEN project mirrors the efforts of AT&T, which announced plans in March to build a pan-European 2M bit/sec network that will initially span seven countries and ultimately support 16 ("AT&T storms Europe in data net offensive," NW, March 16).

But analysts say it is AT&T that will face an uphill battle for European data traffic.

"GEN differs from the AT&T undertaking because each of the five carriers already has a strong presence in Europe," said Jonathan Oglivie, director of sales and marketing with Lynx Technologies, Inc., a Little Falls, N.J., consultancy specializing in international telecommunications. "And all GEN members have a large private-line customer base."

The backbone will consist of E-1 multiplexers located in London, Paris, Frankfurt, Germany, Milan, Italy and Madrid, Spain linked by at least two diverse fiber routes, Saint-Hilaire said. The network will use existing fiber

transmission facilities.

GEN will be monitored from management centers in the U.K. and France.

The carriers will be able to upgrade the net, which is expected to be completed in February, from 2M to over 140M bit/sec if additional bandwidth is needed,



GRAPHIC BY SUSAN J. CHAMPENY

Saint-Hilaire said.

Analysts applauded the carriers' plan. "It looks like this plan directly addresses two major problems that users encounter in building global networks," said Oglivie. "Getting digital private

lines and getting them provisioned quickly."

One user said the carriers decided to build GEN largely for their own reasons. "They realized that they could minimize outages and, therefore, cut costs by moving from an analog infrastructure to a digital backbone network," said Jack Haverty, an internet architect with Oracle Corp., a Redwood Shores, Calif., database vendor. "I wouldn't characterize this [effort] as one that was totally driven by users."

Like many network managers building international networks, Haverty has encountered long installation intervals for dedicated links. "I've waited up to six months for private lines."

Although happy to hear about faster provisioning, users were most impressed with the plans for diverse routing between GEN switches.

"I think it's great that these carriers plan to offer multiple paths between their network nodes," said Reuben Lantto, director of international telecommunications for Cargill, Inc., a Minneapolis-based grain trading and food processing company. "Diverse routing is something that many users, including Cargill, have pressed European carriers for. It's long overdue." □

DEC announces expansion to open systems offerings

By Jim Duffy
Senior Editor

ZURICH — Digital Equipment Corp. last week broadened its open systems portfolio with enhancements to its VMS operating system, application integration software, servers and networking protocols.

DEC's VMS operating system, which the company now calls OpenVMS, supports key industry standards for application portability. DEC is also bundling protocol and database software licenses into its Network Application Support (NAS) integration software, and is adding services, such as electronic mail and network management, to its Transmission Control Protocol/Internet Protocol software.

DEC made its announcements here but will hold a press conference this week at DEC headquarters in Maynard, Mass., where news about U.S. product pricing and availability will be revealed.

OpenVMS supports the IEEE Portable Operating System Interface (POSIX) and X/Open Company, Ltd. standards for application portability. Applications written for OpenVMS should be portable to any platform that

complies with these standards.

Hewlett-Packard Co. and IBM have also committed to support POSIX in their proprietary operating systems.

DEC also brought out Version 2 of TCP/IP Services for OpenVMS. Version 2 includes support for TCP/IP E-mail, network management, Fiber Distributed Data Interface local-area networks and remote printing.

This release of TCP/IP Services allows DEC systems running OpenVMS to exchange E-mail messages with other systems on an FDDI LAN via the Simple Mail Transfer Protocol and be managed by TCP/IP management systems via the Simple Network Management Protocol.

On the NAS front, DEC bundled a license for the DECnet/OSI protocol stack into NAS 200, 300 and 400 application integration software packages. It also added a license for DEC's Rdb/VMS relational database in NAS 300 and 400. Previously, these were available to users as separately priced options to the NAS packages.

DEC last week also unveiled a line of preconfigured servers, called Advantage-Servers, which range in size from desktop to

mainframe-class platforms. Each server comes preconfigured with OpenVMS, DEC's Pathworks network operating system, NAS software and peripherals.

Advantage-Servers span the range of DEC's hardware platforms and offer a fully loaded server under one purchase order.

DEC also unveiled a new VAX 7000 server, the Model 600, that, because of its performance, will be marketed as an information hub in corporate data centers. The Model 600 is upgradable to DEC's Alpha hardware architecture, the successor to the company's VAX system line. □

Correction: In the story "N.Y. legislature passes bill to make toll fraud a felony," (NW, July 6), New York State Senator Dale Volker's district was incorrectly identified. He is a Republican senator representing Depew.

Addendum: Readers who want more information about EcoSystems Software, Inc.'s client/server management products ("New software targets client/server mgmt." NW, July 6) can call John Howorth, the firm's marketing manager, at (408) 252-3801, Ext. 112. The firm is located in Cupertino, Calif. □

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Worth Noting

Total worldwide revenue from sales of asynchronous communications software will more than double between 1991 and 1996, climbing from \$193.1 million to \$467.4 million, according to International Data Corp. in Framingham, Mass.

Data Packets

AT&T and Needham, Mass.-based **Brooktrout Technology, Inc.** last week disclosed a marketing agreement to integrate their interactive voice-response and facsimile products.

Resellers of Conversant, AT&T's interactive voice response system, will offer Brooktrout's TR112 fax board as an option to Conversant users. The TR112 will allow a Conversant system to send a fax to a calling party to provide documentation on a telephone-prompted transaction, for example.

Brooktrout's TR112 is a twin-channel fax card that enables IBM Personal Computer ATs and compatibles to send and receive faxes on two channels simultaneously.

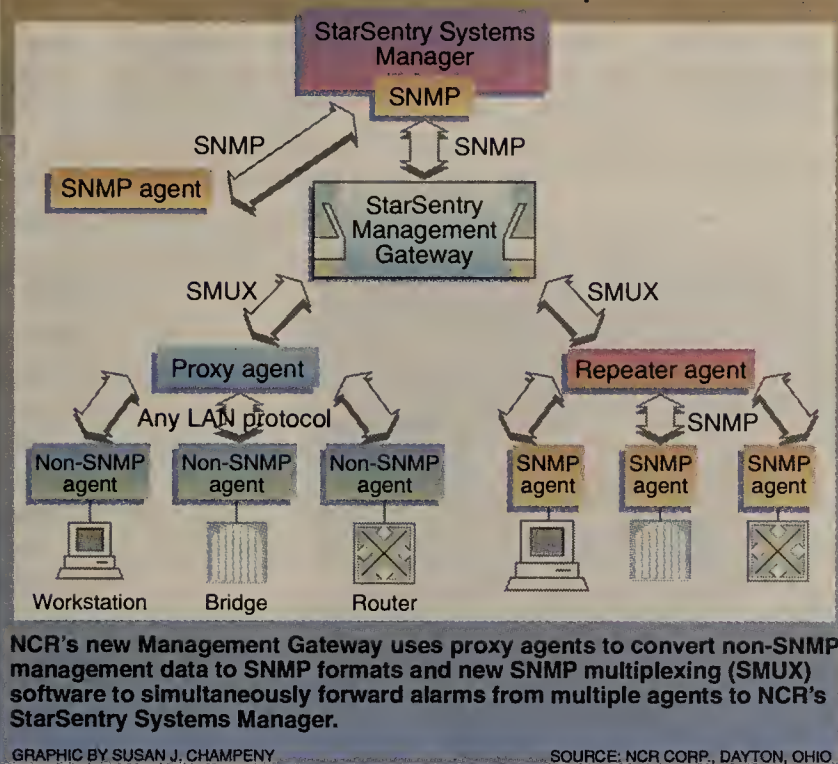
The TR112 is priced at \$1,995.

Telebit Corp. last week slashed the price of its 38.4K bit/sec V.32 modem.

The price of Telebit's QBlazer modem is now \$299, a 50% reduction from the previous \$599 price tag. The transportable device is targeted at users of portable computers.

The QBlazer also supports V.42bis data compression and V.42 error correction. ■

NCR stretches SNMP power



NCR extends StarSentry's reach to non-SNMP wares

Also unveils low-end version of mgmt. system.

By Jim Duffy
Senior Editor

DAYTON, Ohio — NCR Corp. last week brought out a new version of its enterprisewide network and systems management software that includes, among other features, a gateway option that extends its SNMP management capabilities.

At the same time, NCR unveiled a low-cost management system for networks with as

many as 100 nodes. The company also unveiled an option designed to bypass a failed management system in a network that includes several distributed NCR management systems.

A key addition to Version 3.5 is the Management Gateway option.

many as 100 nodes. The company also unveiled an option designed to bypass a failed management system in a network that includes several distributed NCR management systems.

Version 3.5 of NCR's Simple Network Management Protocol-based StarSentry Systems Manager runs on the company's System 3000 and StarServer E platforms under Unix.

A key addition to Version 3.5 is the Management Gateway op-

tion, which enables users to manage non-SNMP devices. The Management Gateway, which had been expected, enables SNMP consoles to manage any device, such as DOS and OS/2 personal computers, as if it were configured with an SNMP agent ("NCR gateway will extend SNMP's reach," *NW*, June 29).

Super agent

The gateway uses proxy agents to translate non-SNMP management protocols to SNMP, as well as multiplexing capabilities that allow StarSentry to simultaneously receive alarms from multiple types of devices or multiple agents on a single device. For example, a single local-area network server might require many agents — one for a protocol stack, such as Transmission Control Protocol/Internet Protocol, and one for each server application. Users only need to register each agent, and the gateway multiplexes them into a single "super agent" capable of collecting and forwarding data from all subagents.

Although it has not been tested or certified to do so, the gateway should be able to run on other SNMP-based management systems, NCR officials said.

Version 3.5 also includes an automatic discovery feature that periodically polls the network for

(continued on page 8)

IBM changes rules for defining 3270s

Latest versions of its VTAM and 3174 software support the dynamic definition of 3270 nodes.

By Michael Cooney
Senior Editor

RALEIGH, N.C. — A little publicized feature in the latest available versions of IBM's VTAM and 3174 cluster controller software will make life easier for SNA users.

The new Dynamic Definition of Dependent LUs (DDDLU) feature in VTAM Version 3 Release 4, available since December, will let users automatically attach IBM 3270 devices to a Systems Network Architecture net without having to take the network down, as was required in the past.

The connection is temporary, however, as most customers will want to add the terminals permanently to VTAM to give them full NetView support.

The new feature only works in conjunction with 3270 devices

linked to the mainframe through a 3174 controller running Configuration Support B Release 4 or Configuration Support C Release 1. Therefore, users need to have the latest releases of VTAM and Configuration Support to make the DDDL feature work.

"The feature lets users attach their [3270], write a little code to get into VTAM and be up and running," said Mark Pozefsky, manager of IBM's VTAM systems design and performance. "Basically, we are taking the VTAM operator out of the loop."

In order to attach new 3270 devices to an SNA net in the past, the entire network had to be taken down and the device registered to VTAM on the mainframe and the Network Control Program (NCP) on the front-end

(continued on page 18)

CICS pack to run on DG's AViiON box

By Jim Duffy
Senior Editor

BILLERICA, Mass. — Integris, a developer of software for porting mainframe applications to lower cost systems, recently reached an agreement to port its software to Data General Corp.'s servers.

Integris, a subsidiary of Bull HN Information Systems, will port its UniKix software to DG's Reduced Instruction Set Computing (RISC)-based, symmetric multiprocessing AViiON systems. UniKix enables existing IBM CICS applications to run on Unix minicomputers and workstations without a rewrite of code.

To accomplish this, UniKix works in conjunction with Integris' XPU5 and XPU4 software. These packages let a Unix system emulate IBM's PU 4 and PU 5 nodes in a Systems Network Architecture network. The nodes are responsible for controlling 3270 sessions and routing data.

So not only is Integris' software intended to provide IBM CICS users with the price/performance benefits of systems such as DG's AViiON, it is also designed to allow users to interoperate with applications on their current SNA networks.

"People are faced with two avenues when they choose to take advantage of today's [lower priced, high-performance] systems," said Frank Kenney, manager of DG's systems software group. One is to rewrite their CICS applications and run them under a Unix transaction processing monitor, he said. The alternative, he said, is to replicate a mainframe environment on a lower end system, as Integris did with its UniKix, XPU5 and XPU4 software.

With UniKix, the company includes the COBOL programming language and IBM's VSAM, which is a storage method.

DG is one of 10 vendors whose Unix platforms can run the Integris software.

DG AViiON systems will be able to run UniKix, XPU5 and XPU4 in September. UniKix is priced at \$8,000 for as many as eight users, and the XPU software is priced at \$800 for as many as eight users. ■

IBM inks VideoLogic agreement, hopes to boost multimedia mart

By Caryn Gillooly
Senior Editor

CAMBRIDGE, Mass. — IBM has announced a development agreement with multimedia vendor VideoLogic Corp. under which the companies will attempt to make multimedia products affordable to almost any user on almost any platform.

Under the terms of the agreement, the two companies will jointly develop and manufacture high-volume, low-cost graphics and multimedia products for the IBM Personal System/2 and other personal computer platforms running either OS/2 or Microsoft Corp. Windows.

According to the firms, product devel-

opment is under way and the first offerings — PC add-on hardware and software — are expected this fall. The hardware will initially be available for IBM's PS/2 line and PCs based on the Industry Standard Architecture (ISA), said Kirke Curtis, general manager at VideoLogic, based here. The boards will be produced for Extended ISA machines as the market warrants.

Working with the boards, which will give PCs multimedia capabilities, will be software that provides integration with IBM's Multimedia Presentation Manager/2 — the company's multimedia exten-

sions for OS/2 — and Microsoft's Windows Multimedia Extensions.

The companies will also make available a development kit for third parties to build support for such capabilities as animation, sound and video into mainstream applications that use standard OS/2 and Windows application program interfaces.

Although Curtis did not elaborate, he gave the impression these multimedia products would not only be for stand-alone machines, but rather could also reside on the server in a local-area network, for example. ☐



"Uh-Oh..." Donna, Accounting



"What The..." Dan, Drafting



"Hey!" Todd, Shipping



"Whoa!" Jan, Production

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NCR extends reach to non-SNMP wares

continued from page 7

new systems and inactive, older systems, and forwards the information concerning net changes to the system manager at a central StarSentry console.

Additionally, a new alarm-forwarding capability lets subnetwork managers monitor their domains with StarSentry and forward alarms to a central StarSentry console that provides an integrated view of the entire network. This feature is intended to give net administrators more flexibility in assigning management resources and more control over distributed StarSentry systems.

The new release also contains an SQL database interface, which enables users to store network information from StarSentry on Informix Software, Inc. SQL databases, as well as generate reports and spreadsheets based on the information.

The Autorecovery option, meanwhile, lets users of multiple StarSentry systems establish one system as a management domain controller.

Therefore, if a StarSentry system responsible for a network domain goes down, the management domain controller reroutes the information from that domain to another StarSentry system.

On a smaller scale

For customers with smaller networks, NCR also announced a lower cost option, called Systems Manager/100, which provides most of the features and functionality of Systems Manager 3.5 for networks with as many as 100 nodes. The discovery feature is offered as an option with Systems Manager/100.

StarSentry Systems Manager 3.5 and Systems Manager/100 are available now and cost \$15,000 and \$5,500, respectively.

The Management Gateway is priced at \$650 and is also available now. The Autorecovery option is priced at \$2,500 and will be available in the third quarter.

StarSentry is built on NetLabs, Inc.'s network management platform. NCR has developed other applications, including software and client management.

In May, NCR announced its membership in the NetLabs Application Exchange program, which is designed to encourage development and exchange of applications based on NetLabs' net management software technology. Other vendors in the program have expressed interest in porting NCR's management applications to their NetLabs-based platforms, NCR officials said. ☐

LOCAL NETWORKING

LAN HARDWARE, NETWORK OPERATING SYSTEMS AND LAN MANAGEMENT

Worth Noting

“If [Novell, Inc. NetWare 4.0's directory services] are anything like NetWare Name Service's, God help NetWare users.”

Jodi Mardesich
Analyst
The Burton Group
Salt Lake City

Netnotes

Network General Corp., based in Menlo Park, Calif., last week released a low-cost version of its Sniffer protocol analyzer that can save customers as much as 50% off the price of the previous version.

The Model 54 has the same software but is now available on the new monochrome Intel Corp. 80486-based portable from Compaq Computer Corp. The new version costs \$4,800 and is available now.

Like the previous version, Model 54 can support Ethernet, token ring, Apple Computer, Inc. LocalTalk, Fiber Distributed Data Interface and other environments, and can support any two of these technologies simultaneously.

Systems Strategies, Inc., a New York-based subsidiary of Nynex Corp., will deliver at the end of this month a 3270 emulator designed to bring IBM mainframe access to Unix-based machines on Novell, Inc. NetWare nets.

Express 3270 for NetWare works with Novell's NetWare for SAA to let Unix-based workstations connected to a Transmission Control Protocol/Internet Protocol-based NetWare network access IBM mainframe services.

The IBM 3270 terminal and printer emulator also lets users print IBM EBCDIC formatted files on ASCII printers.

Express 3270 will work with Unix System V implementations, such as those from
(continued on page 12)

AppleTalk file server has PC price, Quadra 950 speed

Python promises Mac nets twice the performance.

By Margie Wylie
Senior Editor

MESA, Ariz. — Get queasy at the thought of dedicating an expensive Macintosh as a server? Shirt-pocket Software this week will announce an alternative it claims is not only less expensive but faster than Apple Computer, Inc.'s top-of-the-line Macintosh Quadra 950.

Due to ship next week is Easy-Server Python, an Intel Corp.-based personal computer with software that transforms it into an AppleTalk Filing Protocol-compatible server.

To users and administrators, the server behaves like a native AppleShare server, but it works faster, said Jay Eaglestun, Shirt-pocket Software president.

Macintoshes (or any other

computer attached to an AppleTalk network via Ethernet) access Python's files and folders through standard mechanisms using AppleTalk rights and securities.

Administrators manage the server's users, check its logs and perform other routine maintenance tasks from any Macintosh on the network through Python's Macintosh-compatible administration program. Unlike an AppleShare server, the Python also lets managers remotely run diagnostic, optimization and repair utilities against the server's hard disks.

Based on the Intel 80486DX 50-MHz processor, the server offers I/O optimizations that allow it to outperform Macintosh Quadra
(continued on page 12)

IBM, Novell offer OS/2 2.0 clients

By Margie Wylie
Senior Editor

PROVO, Utah — Those users who were dismayed when IBM's OS/2 2.0 shipped sans a compatible Novell, Inc. NetWare client may now find themselves downright confused.

Both Novell and IBM have made the NetWare client available but each with its own packaging, pricing, naming and distribution.

The NetWare Workstation Kit for OS/2 2.0 has been available directly from Novell since late last month.

Despite what the name may imply, the kit contains only the software necessary for a NetWare client, or what used to be known as the NetWare Requester for OS/2, according to a Novell spokeswoman.

The new client lets users view and map network drives through the Workplace Shell, the same graphical mechanism OS/2 2.0 offers for local drives. It can also run alongside IBM's LAN Server client and supports more Named Pipes connections, allowing

some applications that use the interapplication communications facility to operate using NetWare.

IBM, on the other hand, offers the client bundled with an administration utility in a package it calls NetWare Services for OS/2.

The utility, NetWare Management Map for OS/2, lets administrators manage common NetWare functions, such as creating and deleting users and setting access privileges, through OS/2's Presentation Manager graphical user interface.

Novell sells the NetWare Management Map for OS/2 bundled with its NetWare Premium package, which is priced according to the number of users.

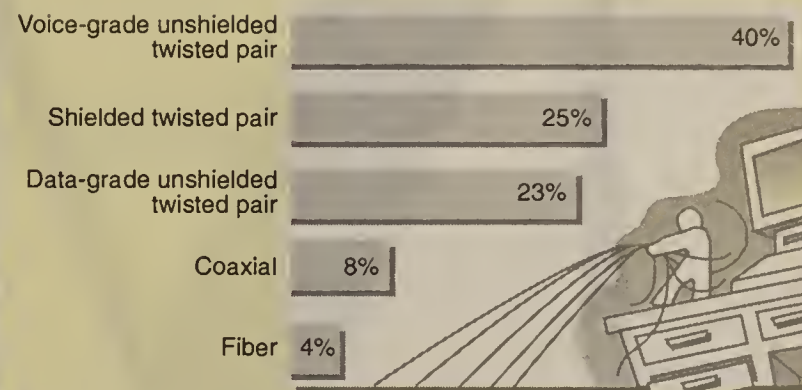
Novell's update can be purchased directly for \$30, which includes unlimited copies for any one site. Users can order the software by calling (800) 873-2831.

IBM sells its package through its own sales force for \$200 per company for unlimited copies, regardless of the number of sites.

Users, however, do not care where they buy the software.

“We ordered it from both of them. But we got it through IBM a lot faster and with less hassle,” said Dan LeMastres, a technology analyst for a large Midwestern telecommunications company, who complained that Novell's first updates came out slowly and on faulty disks. Novell said it has since remedied the problems. □

What cabling type are you pulling to the desktop?



Figures are based on interviews with MIS managers at 53 large corporations in various industries.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

IBM to add support for fiber to desktop

Fiber lobe attachment module will be built by Raylan and have 16 ports for workstations, LANs.

By Caryn Gillooly
Senior Editor

WHITE PLAINS, N.Y. — IBM last week broadened its connectivity horizons by announcing support for fiber to the desktop.

Big Blue unveiled an agreement with Raylan Corp. under which Raylan will rework its existing token-ring concentrator to act as a fiber lobe attachment module (LAM) for IBM's 8230 Controlled Access Unit (CAU).

Dubbed the Raylan Fiber LAM, the new product will give customers the option of running fiber from desktop machines to centrally located 8230s outfitted with LAMs. Although the CAU supports fiber-optic backbone links today, it only supports shielded and unshielded twisted-pair connections to the desktop.

Newfound flexibility

The new LAM will have 16 ports, making it possible to support either 16 individual workstations, 16 separate local-area networks or any combination of the two. Although technically a Raylan product, the LAM will be managed by the CAU as if it were an IBM LAM.

“For example, [IBM's] LAN Network Manager can instruct the 8230 to take a workstation off line,” said John Baltz, manager of LAN new business at IBM.

According to Baltz, IBM added the Raylan product because some of its customers needed the fiber capability, particularly those in the manufacturing industry.

These customers need the additional distance between workstations that fiber affords so they can cover vast plant floors. While copper is limited to distances of about 100 meters, fiber can extend for several kilometers from the CAU to the desktop.

Also, it is these types of environments in which copper-based connections can be affected by electromagnetic interference coming from heavy machinery.

“We wanted to remove media type as a reason people might not buy IBM.”

▲▲▲

“We basically wanted to remove media type as a reason people might not buy IBM,” Baltz said. “Now whatever media the customer chooses, we'll support it.”

Statistics say . . .

Although this is IBM's first foray into the fiber-to-the-desk arena, analysts said the company has not missed much.

According to a recent study by Forrester Research, Inc. in Cambridge, Mass., only 4% of the largest corporations are pulling fiber
(continued on page 12)

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The right choice.

AppleTalk file server has PC price

continued from page 9

ra 950, Shirt Pocket Software claimed.

"The Mac isn't really made to be a server," Eaglestun said. "When the Mac does I/O to disk, it sends out an I/O request and waits for it to finish before it can take another."

The Python's synchronous Small Computer System Interface driver, however, allows the server to retrieve data from disks in background while queuing up incoming

disk I/O requests.

The server also speeds up operations by storing the most recently or most often accessed data in its 256K-byte random-access memory cache. It can fulfill requests for cached data instantly while simultaneously running disk I/O requests in background. A special file system also speeds up the tasks of storing and retrieving files in AppleTalk format.

Priced at \$4,800, the server sells for about half the price of a Quadra 950 AppleShare server with 4M bytes of RAM and built-in Ethernet.

"We like to say that you get twice the speed for half the price," Eaglestun said. The Python can achieve up to 8M bit/sec throughput over Ethernet, while the Quadra 950 can only reach about 4M bit/sec throughput, he noted.

The Python ships with 16M bytes of RAM, a 256K-byte cache and a 16-bit Ethernet card. However, while the Quadra 950 comes with an internal hard disk, the Python does not offer any storage. Users must buy standard Macintosh-compatible external hard disks separately from another supplier. ☐

IBM to add support for fiber to desktop

continued from page 9

to the desktop (see graphic, page 9). Those that are, according to Forrester, are doing so to address specific problems such as security, noise or distance limitations.

Part of the reason users are not flocking to fiber is that fiber LAN adapters cost too much — as much as \$400 more than Ethernet or token-ring adapters, according to Forrester.

Most customers do not need the extra bandwidth often associated with fiber-to-the-desk installations, the study stated, and those that do seem able to wait for the emergence of copper-based Fiber Distributed Data Interface products.

"I don't think we'll ever pull fiber to the desktop," said an MIS director from one pharmaceutical company quoted in the Forrester study. "We're waiting for FDDI over copper, which is probably only one or two years off. Why pull fiber if you can get 100M bit/sec on copper in two years?"

Raylan Fiber LAM is expected to be available by the end of this year, although pricing for the product has not been set. When available, both Raylan and IBM will sell the product, although it will carry the Raylan name. ☐



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NWT

Netnotes

continued from page 9

NCR Corp. or The Santa Cruz Operation, Inc.; IBM's RISC System/6000 Unix; and Sun Microsystems, Inc.'s SPARCstations running Sun's SunOS or SunSoft, Inc.'s Solaris.

The company did not release a price for the offering.

Xerox Corp. has brought out the 7033 LAN Fax Server, an integrated facsimile server that lets Novell, Inc. NetWare users send and receive faxes from their individual workstations.

The product is a fax machine with a server card installed that attaches as a node on the network.

Users can fax documents from a pop-up window without leaving the DOS- or Microsoft Corp. Windows-based application they are running.

Faxes received can be printed out or stored within the NetWare server.

The 7033 LAN Fax Server will be available next month for \$7,895, which includes a Xerox 7033 fax machine, a server board and software.

Citrix Systems, Inc., maker of the Multiuser terminal networking product, has released Multiuser Net-Connect. The new product lets users attached to the company's Multiuser network become full citizens on a Novell, Inc. NetWare local-area network.

According to the company, based in Coral Springs, Fla., when a Multiuser system is attached to the NetWare LAN via a single adapter, all terminals or personal computers attached to Multiuser via asynchronous ports gain access to all resources available on the NetWare LAN, including file, print and database services.

Multiuser Net-Connect is available now and is priced at \$895. ☐

INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

Worth Noting

“Routing is a wonderful technology with numerous advantages, but no router will do me much good if I can’t get it to work.”

Randy Cosby
Network manager
Texas Children’s Hospital
Houston
Commenting on the need for improved vendor support

Star-Tek enhances software with error-detection feature

Pack detects faulty nodes before problems occur.

By Skip MacAskill
Staff Writer

NORTHBOROUGH, Mass. — Star-Tek, Inc. has enhanced its token-ring hub module software with a feature that can instantly detect and deny ring entry to faulty nodes.

The new capability, dubbed Zero Delay Lockout, is loaded onto Star-Tek’s custom phase locked loop (PLL) chip, which the company uses on each port of its Focus Series Active Token-Ring Hub Modules.

The enhanced software takes advantage of the PLL chip’s error-sensing capability to detect common hard error conditions — which are problems that can cause the network to go down, such as plugging a media filter into an enhanced graphics adapter card or trying to attach a node at the incorrect speed — thereby eliminating network downtime associated with those conditions. Zero Delay Lockout can handle 99.9% of these conditions, according to the company.

When a device requests access to the ring, the software will test it and, if a problem exists, will

deny access to the ring and send an alarm to the administrator via the user’s existing net management system.

Zero Delay Lockout does not require a central management system, however. Without such a system, the error detection will not be reported to an administrator, although an LED indicator will blink to signal a problem with any given port.

This approach contrasts with other recovery methods that are initiated only when a faulty node begins beaconing after it has already gained access to the ring. The recovery time for those methods is normally between nine and 90 seconds, during which time the network is inoperative.

Previously, Star-Tek used a Distributed Recovery Intelligence algorithm on its Focus Series token-ring hub modules to handle hard error conditions after they had already disrupted the ring. This capability, which had recovery times of about 20 seconds, will remain on the 20-port hub module as a backup to the

(continued on page 14)

Vitalink server lets SDLC traffic on Ethernet LANs

By Skip MacAskill
Staff Writer

FREMONT, Calif. — Vitalink Communications Corp. last week enhanced its 4100 SDLC Server to support the transmission of SDLC data over Ethernet LANs, adding to its existing token-ring capability.

The 4100 converts Systems Network Architecture/Synchronous Data Link Control traffic coming from IBM 3174 or 3274 cluster controllers to 802.2 Logical Link Control 2 (LLC2) data frames.

That enables SDLC traffic to share the same wide-area links that support a user’s local-area network internetwork, obviating the need for separate but parallel lines dedicated to SDLC.

The 4100 is based on technology from Netlink, Inc.

By concentrating or eliminat-

ing remote SDLC links and moving SNA traffic over bridge/router links, the 4100 can reduce communications costs. A single LAN port on a host-attached front-end processor, for example, can be used in place of several low-speed SDLC ports, thereby reducing hardware and circuit costs.

Local polling

The 4100 also improves performance by polling cluster controllers locally, eliminating the need for the host to poll each remote controller, according to Kurt Bauer, director of product marketing for Vitalink.

The SDLC-to-Ethernet connectivity for the 4100 is available now in the form of a software upgrade and Ethernet LAN card at no charge.

(continued on page 14)

OSPF to RIP: Rest in peace

Open Shortest Path First (OSPF) protocol addresses the shortcomings of the older Routing Information Protocol (RIP)

	OSPF	RIP
Algorithm	Link state	Distance vector
Between source and destination	Unlimited	16-hop limit
Data path selection	Chooses optimal path based on least-cost routing, load sharing and type of service routing	Selection based solely on smallest number of hops required
Routing updates	Small and infrequent	Large and repeated every 30 seconds
Net management functions	Supported	Not supported
Authentication	Supported	Not supported

GRAPHIC BY SUSAN J. CHAMPENY

OSPF: Addressing RIP’s shortcomings

Protocol promises support for larger nets, more optimized routing, better mgmt. and security.

By Maureen Molloy
Senior Writer

Although a slew of vendors have already thrown their support behind it and the Internet Activities Board is expected to ratify it as a standard by year end, some users may still be uncertain of the benefits the Open Shortest Path First (OSPF) routing protocol could bring to their LAN internets.

OSPF was conceived as a way to overcome the drawbacks of the Routing Information Protocol (RIP), the first interrouter standard for Transmission Control Protocol/Internet Protocol-based internets (see graphic, this page). OSPF’s key enhancements over RIP are its ability to support larger nets and optimal routing based on a number of variables, as well as added network management and security features.

“OSPF is a more efficient protocol than RIP because it provides users with more information and enables them to easily add more sophisticated features on their routers. It’s the protocol of choice for high-performance routing,” said John Moy, a senior staff engineer at Proteon, Inc. and an author of OSPF.

Developed by the OSPF Working Group of the Internet Engineering Task Force, OSPF is currently a draft standard and is expected to be approved as a full

standard by the Internet Activities Board by the end of the year.

Although not fully ratified yet, OSPF is widely available today and is considered to be the de facto routing standard that will supplant RIP in most user nets.

As evidence of its growing popularity, more than 15 vendors have already joined the OSPF Interoperability Group — a consortium spearheaded earlier this year by Proteon, 3Com Corp. and Wellfleet Communications, Inc. to test the interoperability of OSPF implementations in multi-vendor LAN internetworks.

Improving on RIP

Vendors expect OSPF to overcome the shortcomings inherent in a distance vector algorithm such as RIP. According to Moy, distance vector algorithms have restrictions that make them unsuitable in large internetworks, the most severe being a limited hop count, excessive bandwidth consumption and cumbersome routing table update methods.

RIP supports a maximum of 16 hops — the number of routers data can traverse before reaching its destination — making it unsuitable for the largest of internetworks.

In addition, RIP-based routers broadcast a full dump of their routing tables to neighboring

(continued on page 14)

Link Notes

AT&T Paradyne has announced it will resell Cisco Systems, Inc. StarWAN routers, which can simplify communications between dissimilar local- and wide-area networks by choosing the most direct, cost-effective transmission routes. The Model 100 is priced between \$7,000 and \$8,400, depending on configuration. The Model 450 costs between \$25,000 and \$65,000, also depending on configuration.

BBN Communications Corp. has announced a new release of its T/200 Internet Packet Router for government users that supports as many as 200 nodes and the Border Gateway Protocol (BGP).

BGP is a routing protocol that cuts down on the amount of broadcast traffic that occurs when routers swap routing tables by sending only the changes rather than entire routing files. As the network grows, incremental updates do not overburden it with increasing message sizes.

The latest release is also certified by the Defense Information Systems Agency for connection to the agency’s Defense Data Network.

According to a recent re-

(continued on page 18)

Vitalink server lets SDLC traffic on LANs

continued from page 13

New shipments of the server, which comes in three models, will include the capability.

Product pricing

Pricing for the 4102, which has two SDLC ports, begins at \$7,150, while the four-port 4104 starts at \$8,500. The high-end 4116 offers 16 SDLC ports and is priced from \$9,900.

Vitalink last week also reduced the prices of its token-ring bridges and bridge/routers, some products by more than 50%.

Effective immediately, pricing for TransPath bridge/routers start at \$9,650, while TransRing bridges start at \$8,900.

A two-port TransPath 550 bridge/router with a T-1 interface, for example, is now priced at \$10,650, a 53% reduction from its previous cost of \$22,500. A two-port TransRing 550 bridge, which used to sell for \$16,500, now costs \$9,900, a 40% discount. **Z**

OSPF: Addressing RIP's shortcomings

continued from page 13

routers every 30 seconds, thereby consuming considerable bandwidth. Finally, RIP sometimes fails to choose the most efficient or economical path since it always takes the least-hop option and does not take into account factors such as the cost, speed and reliability of other paths.

OSPF addresses the drawbacks associated with RIP as well as user requirements for load balancing, network management and authentication support.

OSPF is a link state algorithm that significantly trims the amount of data routers need to send one another. With link state protocols, the routers do not send one another routing tables, but rather information about which links each router has to adjacent routers. Once that has been established and the routers are synchronized only keep-alive messages are sent, along with any routing changes that occur. In other words, updates are made only when the network changes.

This incremental update process — in contrast to RIP's frequent flooding of routing tables — enables OSPF to be miserly about bandwidth consumption. It also allows the router to respond more quickly to network failures because its database actually serves as a detailed map of the net.

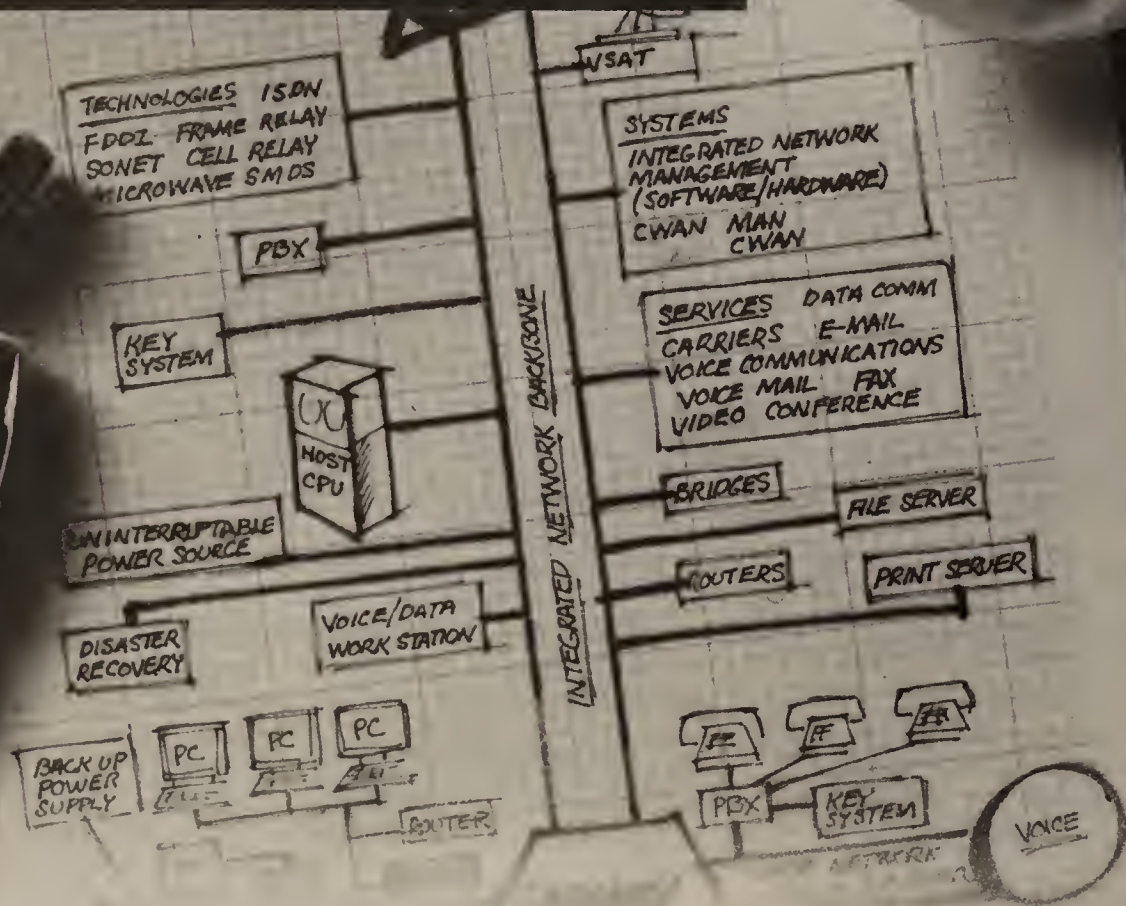
The database tells the user how many routers are in the network, which net segments each router supports and the current status of each attachment. This information then helps the network manager more easily pinpoint net failures.

Also unlike RIP, where path selection is based solely on the smallest hop count between the source and destination node, OSPF optimizes routing by permitting the user to choose a routing path based on a number of variables, including delay, line speed, dollar cost and anticipated usage. In addition, OSPF allows unlimited hops between source and destination nodes.

Using OSPF, a user can tailor an internetwork to consider the speed of each data path, the amount of traffic between locations or the costs — in dollars and response time — of transmitting along alternate paths. OSPF also enables users to implement Type of Service Routing, which enables applications to be routed over separate data paths, depending on their level of urgency. It further provides load balancing by enabling traffic to be split among multiple least-cost paths.

Finally, an OSPF packet is also equipped with an authentication field in its header that prevents routing information inside an OSPF router from being corrupted. This field bars unauthorized routers from communicating with OSPF routers since two OSPF routers can communicate only if the field is set appropriately. **Z**

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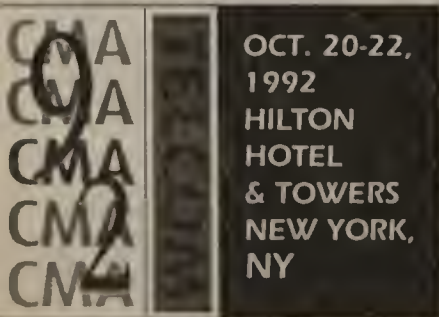
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Star-Tek enhances software with feature

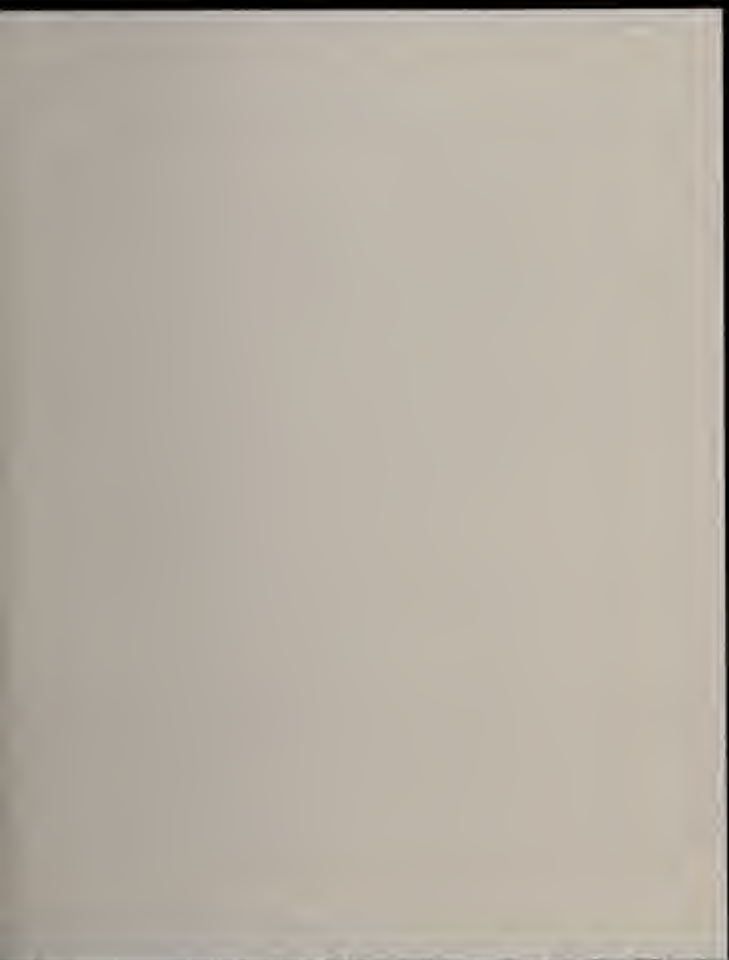
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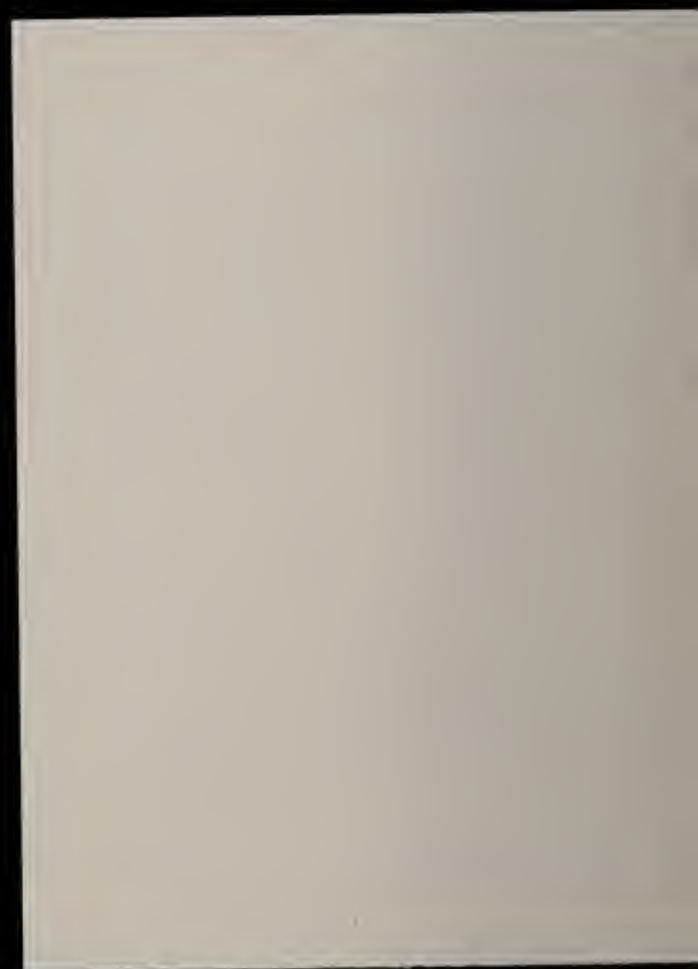
new recovery feature.

The enhanced software has saved the American Bankers Insurance Group, Inc. in Cutler Ridge, Fla., a lot of time and effort during its migration from AT&T's StarLAN to Novell, Inc.'s NetWare.

"Zero Delay Lockout has helped us in situations where users are trying to get onto the new ring at the wrong data rate," said Joe Texixido, technical analyst for American Bankers. "Normally, that would cause some downtime, but the new feature won't even give them access."

Zero Delay Lockout will be included on all Focus Series Active Token-Ring Hub Modules, which are available now and cost \$2,500. A firmware upgrade is available at no charge for existing modules. **Z**





GLOBAL SERVICES

DOMESTIC AND INTERNATIONAL VOICE/DATA SERVICES, ACCESS EQUIPMENT AND REGULATORY ISSUES

Worth Noting

The North American market for cellular equipment and services will climb from \$5.7 million this year to \$9.04 million in 1995, according to a recent report by Insight Research Corp., a Livingston, N.J., research and consulting firm.

Regulatory Update

Ending more than six months of inactivity on the Tariff 12 front, AT&T has filed a new \$25 million custom network deal, Option 110. The five-year deal, which was filed for an unnamed customer, offers a discounted package of switched voice services and leased lines, including 13 T-1s.

There is no 800 service in the arrangement, although AT&T could have included it due to new Federal Communications Commission rules. Those rules require existing AT&T 800 customers to switch 800 numbers in order to get discounted service under a Tariff 12 deal.

Prices in the deal for on-net switched voice service during business hours range from 5.9 cents per minute for calls as far as 292 miles to 9.4 cents per minute for calls between 1,911 and 3,000 miles. Prices for off-net and off-net to on-net calls are higher and include switched access charges as well as, in some cases, charges for authorization codes.

The deal includes a volume discount of 3% for monthly charges between \$50,000 and \$125,000; 5% for charges between \$125,000 and \$300,000; and

(continued on page 18)

Resellers batten hatches for battle against AT&T

Claim carrier is illegally refusing to sell service.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — AT&T resellers, many of whom claim the carrier is illegally refusing to sell them service, have escalated their battle by filing formal complaints with the Federal Communications Commission and a lawsuit in a California district court.

Affinity Network, Inc. and Business Choice Network, resellers in Los Angeles and Chesapeake, Va., respectively, have filed formal complaints with the FCC alleging AT&T is deliberately refusing to sell them service. Affinity also filed a lawsuit against AT&T claiming the carrier is "engaging in a systematic plan" to drive out competitors by illegally refusing to sell them service.

At least a dozen resellers have alleged AT&T is illegally stonewalling resellers and refusing to sell them discounted services under Tariff 12. They say AT&T is violating provisions of the Communications Act of 1934, which prohibit carriers from discriminating among customers, as well

as FCC rules that require AT&T to make all of its services available for resale.

The FCC has yet to act on the resellers' complaints, but in a recent order on Tariff 12, the agency reiterated that AT&T cannot restrict the resale of Tariff 12 deals. The agency has said that anyone willing to meet the terms and conditions of the custom network deals has the right to purchase them for the same rates.

This has led some telecommunications attorneys to say privately that AT&T faces serious legal problems if the allegations are true.

The requirement to sell services to all customers on an equal basis is one of the most fundamental principles governing long-distance regulation. Some observers say if AT&T is free to pick and choose to whom it will offer the best deals, all users may be at risk for discrimination.

AT&T has repeatedly denied that it is purposely doing anything to harm resellers. The carrier

(continued on page 18)

MCI enhances its Vision package for midsize users

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — MCI Communications Corp. has announced a series of enhancements to its Vision offering, a packaged service targeted at midsize businesses.

Included are MCI Vision 800, a new inbound calling option; MCI Perspective, a billing analysis tool for Vision calling options; and discounts on calls to the area code with the highest monthly charges.

Sprint Corp. was the first of the Big Three to offer an 800 calling option — dubbed Clarity — for midsize customers. Because of its dominance in the 800 services market, AT&T is not allowed to package 800 services with its other offerings.

"This is MCI's response to Clarity," said Robert Self, president of Market Dynamics, a New York tariff analysis firm. "Adding

800 to Vision gives MCI about a year of joint discounting before 800-number portability is attained." Portability will enable users to retain their numbers if they move from one carrier to another.

Announced in June 1990, Vision was developed specifically for customers with multiple locations that together spend \$1,500 to \$50,000 a month on domestic and international services.

Services included under Vision are one-plus dialing, calling card, international and switched 56K bit/sec digital data calls. Traffic from these services is combined to earn volume discounts.

The 800 calling option offered under Vision supports a wide variety of features including time-of-day and day-of-week routing and enables users to select area codes from which they wish to receive calls.

(continued on page 18)

Nynex rolls out frame relay

Service	Frame Relay Service
Availability	New York now, Massachusetts next month
Initial platform	Northern Telecom, Inc. central office switches with special software
Long-term platform	Broadband net switches and Northern Telecom switches
Deployment	• 12 service points in Manhattan, other boroughs and downstate New York • About 12 service points in Boston and other eastern Massachusetts cities
Port access speeds	• 56K bit/sec • 384K bit/sec (by year end) • 1.5M bit/sec
Pricing	\$67 flat monthly charge per 56K bit/sec port and first PVC
Additional permanent virtual circuits (PVC)	• \$985 flat monthly charge per 1.5M bit/sec port and first PVC • \$10 for 2 to 5 PVCs • \$5 for 6 to 10 PVCs • \$1 for more than 10 PVCs
How sold	Monthly basis or under 3- to 5-year contracts

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: NYNEX CORP., NEW YORK



Nynex details public frame relay strategy

New offering is available in New York and will be provided to Massachusetts users next month.

By Bob Wallace
Senior Editor

NEW YORK — Nynex Corp. last week detailed deployment plans for a public frame relay service based on Northern Telecom, Inc. central office switches in New York and Massachusetts.

Nynex said it now offers its Frame Relay Service here and in downstate New York through 12 service points — five in Manhattan and seven throughout the other boroughs and eastern New York state.

The carrier said it plans to offer Frame Relay Service next month from about a dozen service points in Boston and other eastern Massachusetts cities.

In both states, cities will be added in early 1993 based on user demand for frame relay.

In New York, Nynex upgraded a dozen Northern Telecom DMS-SuperNode central office switches with the vendor's DataSpan software in order to offer frame relay. Nynex is the first regional Bell holding company to use the Northern Telecom platform to deliver frame relay service.

All 12 Northern Telecom switches now support 56K bit/sec port access speeds, while only a subset are configured to support 1.5M bit/sec port access speeds. The carrier plans to offer 384K bit/sec access to customers in both states by year end. Users will need a dedicated T-1 access pipe to use the 384K and 1.5M

bit/sec options.

"We're certain that there's strong demand for 56K access, but it remains to be seen if there's as much interest in the higher speeds," said John Shaw, staff director of data product development for Telesector Resources Group, a Nynex unit that handles new service development for New York Telephone Co. and New En-

Nynex is the first regional Bell holding company to use the Northern Telecom platform to deliver frame relay service.



gland Telephone and Telegraph Co.

Nynex charges users in New York a flat \$67 monthly fee for each 56K bit/sec port and one permanent virtual circuit (PVC). Each 1.5M port and PVC will carry a flat \$985 monthly fee.


Additional PVCs will cost \$10 each for as many as five, \$5 each for six to 10 PVCs and \$1 each for more than 10 PVCs, Shaw said. "We think users will find this

(continued on page 18)



PS/2

*NSTL test conducted against 386 SX and 386 DX systems. **Sale or delivery of the IBM PS/2 486SLC2 Processor Upgrade is subject to FCC approval. Planned availability of the IBM PS/2 486SLC2 Processor Upgrade is 4th quarter 1992. Offer available from June 11 through October 1, 1992. HelpWare available only in U.S.A. IBM, PS/2 and OS/2 are registered trademarks and HelpWare and HelpCenter are trademarks of International Business Machines Corporation. Windows is a trademark of Microsoft Corporation. ©1992 IBM Corp.



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IBM changes rules for 3270s

continued from page 7

processor — not a trivial task for large users that are expanding or constantly rearranging their nets, Pozefsky said.

DDDLU gives such users more flexibility by enabling them to quickly add 3270 nodes at any time to get users up and running. The users can be permanently added at a later, more convenient time.

Users will likely want to make the switch to permanent definitions at some point because IBM's net management platform, NetView, provides little control over DDDLU-attached devices. For example, NetView can tell that the devices have come on-line but cannot stop or restart them.

Pozefsky said that, for now, the feature is only useful for IBM 3270 terminals, but 3270-emulation products running on personal computers will also be able to use the feature in the future.

"There are a lot of systems out there that emulate 3270s and 3174s, so we are talking to a wide range of vendors that could use

this feature," Pozefsky said.

Analysts said the new feature fills in a 10-year gap in SNA and makes the venerable architecture more flexible.

"The need to define every application, link, PU and LU to VTAM has been a perennial complaint about SNA," said Anura Guruge, a strategic consultant at-large based in New Ipswich, N.H. "It should've been added to VTAM 10 years ago; it would've saved users about 60% of their NCP and VTAM gens."

Although their numbers have been steadily declining in recent years, there are still more than six million 3270 terminals in user nets worldwide, according to market watchers at International Data Corp. in Framingham, Mass. Therefore, there is still a need to enhance 3270 communications capabilities, analysts said.

Users agreed, saying the DDDLU feature will give them increased flexibility and reduce programming costs.

"The feature means we can change things on the network on the fly," said Jeffery Whitlow, telecommunications systems engineer with First Colony Life In-

surance Co. in Lynchburg, Va. First Colony does not have VTAM 3.4 yet but will be migrating to it in about six months.

"It'll be especially useful for remote users who can now attach to the network immediately, rather than wait a week or so for us to add them to the system," he said.

The Travelers Corp. in Hartford, Conn., does not have VTAM 3.4 either, but the firm is also interested in using the new feature when it migrates to the new version.

"With as much moving of terminals as we do, this sort of feature will be very useful," said Steve Simon, a telecommunications engineer project manager with The Travelers. "It will save time and administrative costs, as well."

Simon said he has some questions about the new feature, such as the performance impact of bringing devices on the net dynamically and what happens to those users should the power go out. "Even so, DDDLU is the kind of feature that helps us cost-justify moving to the next level of VTAM," he said. ■

Resellers batten hatches for fight

continued from page 15

er says that many of its actions, such as trying to discontinue selling the Tariff 12 option most widely sought by resellers, are prompted by business considerations that have nothing to do with resellers.

However, in a previous interview with *Network World*, Joe Nacchio, president of AT&T's Business Communications Services Group, acknowledged that the carrier has concerns about reselling Tariff 12.

"My concern is that we have resellers that misrepresent themselves as sales agents of AT&T when they're not. I get a lot of customers complaining about reseller behavior; they think they're dealing with [AT&T] when they're dealing with [resellers]," he said.

Nacchio added that resellers have a role in the market and that he will serve them. But he said he doesn't think they are the same as end users and, therefore, may not necessarily qualify for the same treatment.

"Resellers don't have the same service requirements — the same volume of orders per location, how frequently they change," Nacchio said. "We designed those [Tariff 12 deals] and those rate structures for the needs of a specific customer. The resellers don't fit that."

Until now, resellers have made informal complaints to FCC officials and have filed protests through the normal rulemaking process.

By moving on to formal complaints and lawsuits, the resellers are hoping to increase the pressure on AT&T. As an example, in its lawsuit, Affinity widened its attack on AT&T to include allegations of unfair business practices and anticompetitive conduct covered by federal and California laws other than the Communications Act.

"AT&T has systematically sought to kill switchless resellers," Affinity alleges in its lawsuit. The reseller claims that AT&T has included restrictions in its tariffs, such as the number of

locations from which traffic can originate, in an effort to eliminate resellers from using those tariffs.

AT&T has also promised to provision service within 45 days and then made available only a few of the promised circuits, Affinity claims. Moreover, the carrier has stonewalled the firm by "intentionally misplacing or losing customer orders." Affinity has been trying since January to purchase Tariff 12 Option 58.

Affinity also claimed in its lawsuit that AT&T has imposed large deposit requirements on resellers, delayed bills, refused to apply credits and contacted custom-

By moving on to lawsuits, the resellers are hoping to increase the pressure on AT&T.

▲▲▲

ers urging them not to purchase service from resellers.

In its complaint to the FCC, Affinity reiterates many of these allegations and says AT&T has lied to the agency about its actions against resellers. "AT&T's written submissions to the [FCC] stating that Tariff 12 offerings would be available for resale were knowingly false," according to Affinity.

Business Choice Network, which has been trying to purchase Option 58 since January, raised similar concerns in its formal complaint.

In letters to AT&T, John Williams, chief executive officer of Business Choice, asserted on an almost weekly basis that AT&T was attempting to delay selling its Tariff 12 services. In response, AT&T officials wrote to the reseller, saying that the carrier was taking no longer to provide service to Business Choice than to other Tariff 12 customers. ■

Link Notes

continued from page 13

port from **Insight Research Corp.**, the rapid growth in the market for bridging and routing equipment that began in 1990 will continue at least through 1996. During that time frame, revenue from bridge and router equipment and services in North America, Europe and Asia is expected to jump from \$976.3 million to more than \$2.8 billion.

Computer System Prod-

ucts, Inc. (CSP) has unveiled SmartStar, an active repeater that adds distance and diagnostic capabilities over unshielded twisted-pair wiring.

SmartStar provides diagnostic information such as cable fault detection and link status via front-panel LEDs. The product can also extend the length of IBM Application System/400 and System/3X terminal cable runs to 4,500 feet.

It is available in a single-port, stand-alone model or a two-port, rack-mounted version. For more

information, contact CSP at (800) 422-2537.

Bridge/router manufacturer **North Hills, Inc.** recently earned the International Standards Organization's (ISO) 9001 quality assurance certification.

To earn the certification, companies must meet a range of standards covering design, testing, service, training, quality assurance and other criteria. It is one part of the ISO 9000 Series of five international standards related to product quality. ■

Nynex details frame relay

continued from page 15

pricing arrangement attractive." The telephone company will use the same strategy to determine rates for Frame Relay Service offered by New England Telephone.

Users can buy Frame Relay Service from New York Telephone on a monthly basis, or sign a three- or five-year contract for the offering. Customers that sign a three-year contract pay a flat \$62 monthly fee for each 56K bit/sec port and the first PVC, and \$910 for each 1.5M bit/sec port and one PVC. Those that sign a five-year contract pay a \$57 flat monthly fee for each 56K bit/sec port and one PVC, and a flat \$840 monthly fee for a 1.5M bit/sec port and one PVC.

New England Telephone will offer similar pricing arrangements, Shaw said.

Although Nynex is initially offering frame relay from the Northern Telecom central office switches alone, the carrier will eventually use those switches as concentrators to pass low-speed frame relay traffic to a broadband backbone net, Shaw said.

"We'll likely use the Northern switches to collect 56K and 384K traffic to the broadband switches," Shaw said. "And T-1 access would probably only be supported on the broadband switches."

Nynex is evaluating several broadband net switches for use in such a backbone, but would neither identify the devices nor say when it would begin installation.

Nynex has already conducted a frame relay interconnection trial with WilTel and is amid a similar undertaking with Sprint Corp. Shaw said the purpose of the trials is to learn how to provision, monitor and troubleshoot frame relay service. ■

Regulatory Update

continued from page 15

7% for charges over \$300,000.

The deal was to take effect last week, but Sprint protested the offering, saying it was designed for only one customer and was not generally available as required by FCC rules. Sprint said AT&T included limitations on such items as the number of access facilities, and local and interoffice channels in an effort to restrict the offering to a single customer.

"Clearly, the discriminatory tactic of restricting service based on the minimum annual charge, collections of services, time commitments and access arrangements allows AT&T to charge certain favored customers reduced rates in violation of Section 202 of the Communications Act [of 1934]," Sprint stated in a petition against the deal. ■

MCI enhances its Vision pack

continued from page 15

MCI has also enhanced Vision by adding MCI Perspective, an IBM Personal Computer and compatible billing analysis and management tool for all MCI Vision calling options.

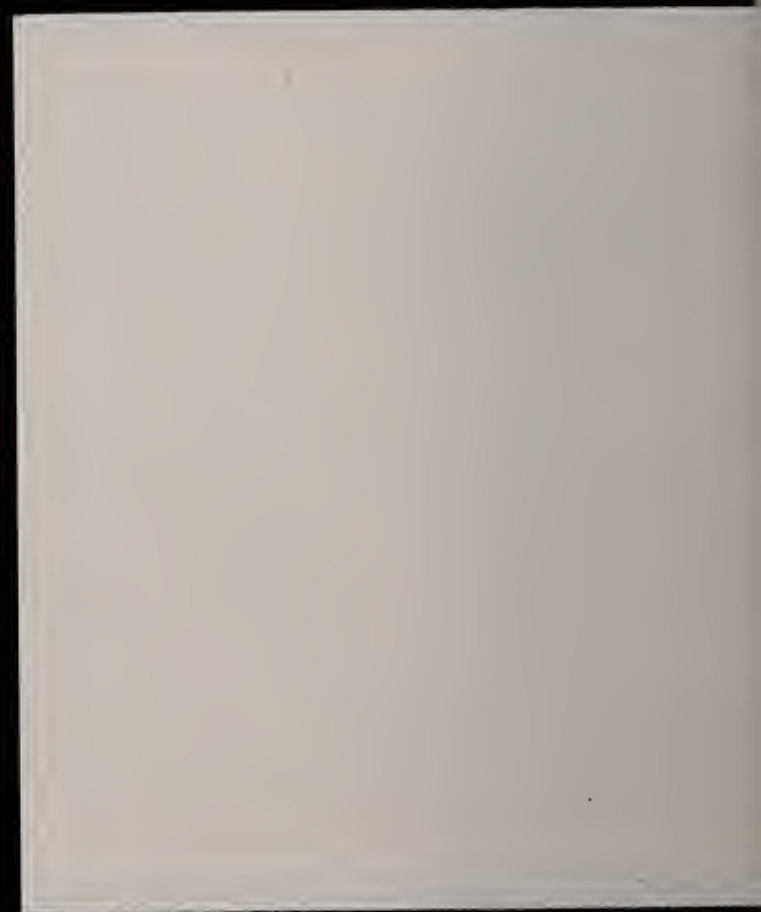
The PC must have at least 64K bytes of random-access memory to run the package, which is free. MCI sends more than 30 standard and customized management re-

ports via MCI Mail — rather than on diskette — to Vision users.

MCI Perspective can be used to generate a variety of call management reports that network managers can use to analyze calling trends and make more efficient use of Vision calling options.

The carrier also introduced MCI Vision Domestic and International Optimizer discounts. MCI offers users a 10% discount on calls to the area code and the foreign country that generates the highest monthly charges. ■





ENTERPRISE APPLICATIONS

CLIENT/SERVER AND ENABLING SOFTWARE: DISTRIBUTED DATABASE, MESSAGING, GROUPWARE AND IMAGING

Worth Noting

“Most integrated network management systems take a two-pronged approach to managing client/server networks. They focus on computers and networks, and neglect to manage software.”

Mike Fung
President and chief executive officer
EcoSystems Software, Inc.
Cupertino, Calif.

Cadre software aids users in downsizing applications

DB Designer provides portability to Unix platforms.

By Timothy O'Brien
West Coast Bureau Chief

MENLO PARK, Calif. — Cadre Technologies, Inc. last week announced a new version of its DB Designer programming workbench that allows older, host-based applications to be converted into Unix-based SQL applications.

DB Designer Release 3.1 can be used to reengineer legacy database or file-structure applications to work with leading relational database management systems such as Oracle Corp.'s Oracle Server and Sybase, Inc.'s SQL Server on Unix servers.

Cadre also announced a joint marketing alliance with Oracle to provide reengineering solutions involving DB Designer and Oracle Computer Assisted Systems Engineering tools to corporations migrating to relational technology. Also, the firm is discussing similar agreements with other database vendors.

“The reengineering of legacy

data to relational technology is a primary concern for organizations,” said Dave Banks, Cadre's executive vice-president. “That's why we are teaming up with the leading vendors to provide a breadth of database reengineering solutions for open systems.”

DB Designer, which came out last fall on OS/2 as a workstation-based design workbench, will now be available on Sun Microsystems, Inc.'s scalable processor architecture servers and workstations. Cadre also plans to port to other leading Unix platforms, including those from Hewlett-Packard Co., IBM and Digital Equipment Corp.

Using DB Designer, developers can reengineer IBM VSAM and IMS, Computer Associates International, Inc. IDMS, DEC RMS and other database applications into client/server SQL applications.

DB Designer provides tools that automate every phase of the
(continued on page 21)

HP bolsters net features of its Allbase

By Wayne Eckerson
Senior Editor

PALO ALTO, Calif. — Hewlett-Packard Co. this week announced a new version of its HP Allbase/SQL relational database management system that supports such distributed database features as replication, stored procedures and two-phase commits.

With the new features, HP Allbase/SQL Version F.0 can interoperate across multiple servers in a distributed computing environment (DCE), where previous versions operated only on a single server. HP officials said the relational DBMS supports high-volume, on-line transaction processing yet costs one-tenth as much as typical mainframe databases.

HP Allbase/SQL runs on all HP 3000 and 9000 platforms. In addition, it has read/write connec-

tivity to IBM's DB2.

The enhanced database is compliant with the ANSI SQL 1 standard and is partially compliant with ANSI SQL 2.

System access

Users can access HP Allbase/SQL from a variety of front-end programs, including HP's Allbase/4GL, Information Builders, Inc.'s Enterprise Data Access/SQL and Focus, Powersoft Corp.'s Powerbuilder and Cognos, Inc.'s Powerhouse.

HP also announced this week that Channel Computing, Inc.'s Forest & Trees and tools from Uniface Corp. can be used to access HP Allbase/SQL.

According to company officials, HP Allbase/SQL offers 30% to 50% better performance than third-party relational DBMSs because it is tightly integrated with HP's MPI/iX and HP-UX operating systems.

HP said it plans to make HP Allbase/SQL available on other vendor platforms in the future, although officials would not specify when.

HP Allbase/SQL offers many new features that will enable us-
(continued on page 20)



Paul Watz (left) and Ken Ridgely discuss downsizing efforts.

User downsizes in an off-the-shelf way

Motorola unit opts for Unix machines running packaged software over mainframe applications.

By Wayne Eckerson
Senior Editor

TEMPE, Ariz. — Last year, Motorola, Inc.'s Computer Group (MCG), based here, embarked on a two-year migration from IBM mainframes running applications developed in-house to distributed Unix processors using primarily packaged applications.

While the project will not be completed until the first quarter of 1993, MCG is already reaping considerable benefits. The group has been able to cut its information systems (IS) budget by 40% while shortening application development cycles, sometimes from months to minutes.

“To meet Motorola's overall quality and cycle-time reduction goals, we needed to make a paradigm shift in our approach to systems development,” said Paul Watz, director of information technology at MCG, located here. “We need systems that are flexible and can adapt to rapid changes in our business environment.”

MCG is one of three groups within Motorola's General Systems Sector that is downsizing from IBM hosts to Unix processors. The other groups are the Cellular Subscriber Group, which makes cellular phones, and the Cellular Infrastructure Group, which makes cellular switches. Together, the three groups have cut more than \$40 million from the sector's annual IS budget, according to William Connor, director of information technology for

the General Systems Sector.

For Motorola, the key to gaining systems flexibility in a distributed environment is to rely as much as possible on packaged software.

“We have made a commitment to avoid purchasing or developing proprietary software because our business moves too fast to justify the investment in time or money,” Connor said.

Packaged software relieves the in-house development staff from having to upgrade applications to support each new release of an operating system or a new hardware platform. It also makes it easier to standardize a single set of applications for accounting, inventory and other general operating functions that can be used across departments, reducing costs significantly.

But MCG has had to weigh the cost savings that come from standardizing software packages throughout the group against the individual needs of each division in the group.

“We try to balance our business and systems requirements with what's available. But there are times when it isn't appropriate to change the business to fit the software,” Watz said.

In order to customize packaged software to meet end users' needs, MCG established a set of criteria for evaluating off-the-shelf software.

To start, the software had to be written in a pure fourth-generation
(continued on page 21)

Store & Forward

WATCOM recently announced an SQL database server and tools that enable users to develop SQL applications that run on both stand-alone DOS personal computers and multiuser networks. The Developers Edition of WATCOM SQL includes a single-user SQL database server for stand-alone PCs with at least 640K bytes of memory and a fourth-generation language for developing applications. The Network Server edition provides an SQL database server that supports as many as six users in a basic version or an unlimited number of users in a 32-bit version.

SQL applications built for stand-alone PCs using WATCOM SQL can run without modification on large networks. WATCOM does not charge royalties to developers that sell WATCOM SQL applications written for stand-alone PCs.

Pricing is \$795 for the Developers Edition, \$795 for the six-user Network Server Edition and \$1,595 for the unlimited network edition. Introductory discounts are available. Call (800) 265-
(continued on page 21)

Cognos development tool out in client/server form

By Timothy O'Brien
West Coast Bureau Chief

BOSTON — Cognos, Inc. recently announced client/server versions of its Unix-based application development software that makes it possible to integrate applications with third-party databases, graphical user interfaces (GUI) and networks.

This announcement reflects a strategic shift for the company toward a more open, scalable architecture that will allow it to tie its development products with: databases such as Borland International, Inc.'s Unix-based InterBase, Sybase, Inc.'s SQL Server and Oracle Corp.'s Oracle Server; interfaces such as the Open Software Foundation, Inc.'s Motif; and network operating systems such as Novell, Inc.'s NetWare and Microsoft Corp.'s LAN Manager.

Powerhouse Version 7, the first implementation of this strategy, is a client/server version of Cognos' development tool that is based on a fourth-generation language and now runs on six differ-

ent commercial Unix platforms.

In addition, Cognos introduced Powerhouse Windows, part of the server-based development software that provides simultaneous support for Microsoft's Windows and character-mode terminals.

Powerhouse Version 7 runs on six different commercial Unix platforms.

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"With this release, we are allowing our customers to move their applications into the client/server architecture without having to throw anything out and start over," explained Mike Laginski, vice-president of marketing at Cognos.

Until now, Cognos has offered

its fourth-generation application development environment running exclusively on Unix servers supporting terminal-emulation devices.

The Unix platforms supported now are Sun Microsystems, Inc.'s SunOS, IBM's AIX, Hewlett-Packard Co.'s HP-UX, Digital Equipment Corp.'s Ultrix and Data General Corp.'s DG/UX.

With release of Version 7, Cognos has now added support for The Santa Cruz Operation, Inc.'s Unix in order to tap personal computers based on Intel Corp. processors.

Powerhouse tools are used for designing and implementing transaction-oriented and batch applications. They also provide a full set of report writers for end-user queries and more complete analysis and summary reports. Applications are implemented on the various platforms with the Powerhouse run-time version.

According to Laginski, the company introduced Powerhouse Windows so customers could move to Windows-based workstations in order to take advantage of the Windows GUI but still preserve their investment in existing terminals.

Cognos will also add Unix server support for two of its exist-

ing Windows-based products, PowerPlay, an analysis tool, and Impromptu, a desktop tool providing access to SQL databases.

Powerhouse clients are linked to servers using the Transmission Control Protocol/Internet Protocol, as well as through serial connections. Additional network support will be offered for Net-

Ware and LAN Manager.

All products will be available later this summer, including Powerhouse fourth-generation language Version 7, InQuizitive, Architect and Powerhouse Windows for Unix, as well as Unix server support for PowerPlay and Impromptu. Prices range from \$1,000 to \$150,000. ■

HP bolsters its Allbase

continued from page 19

ers to use the relational DBMS in a DCE. These features include database shadowing that enables users to automatically replicate and synchronize data in HP Allbase/SQL databases across a network. This feature ensures that all databases are up to date and provides automatic back up of primary databases, even if they are in continuous use.

Added support

Version F.0 also supports two-phase commits, which ensure that database updates made across a network are completed reliably. It also stores compiled queries so they can be executed without recompilation in subsequent uses.

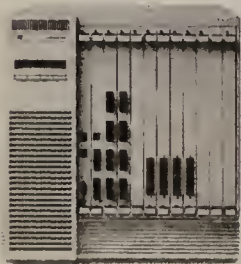
HP Allbase/SQL also supports stored procedures, triggers and business rules. These essentially are programs stored within the database that are executed in response to user commands or automatically when the values of data within specified fields or records exceed predefined parameters.

HP officials said the system provides 30% higher throughput due to new record-level locking and indexing features.

HP Allbase/SQL Version F.0 is available now on HP 3000 computers and will be available in August on HP 9000 workstations and servers.

According to the vendor, prices for the management system range between \$1,500 and \$59,100, depending on the size of the computer and number of users supported. ■

Distributing bandwidth on the network



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And should you want to connect your most bandwidth-hungry users directly to FDDI—you can configure up to 42 fiber connections.



User downsizes off-the-shelf way

continued from page 19

ation language and had to come with computer-aided software engineering tools so MCG could maintain and modify the applications as needed, Watz said.

MCG also decided the software should support triggers, which are pieces of code that can be added to software programs without fundamentally altering the core application. Triggers allow users to modify software without having to assume responsibility for supporting the entire application. Users have to support only the trigger code, while the vendor maintains the rest.

Finally, the software had to run on either Oracle Corp. or Informix Software, Inc. relational databases, and the vendor had to have a worldwide network of value-added resellers that can support the software in place.

MCG chose software from FourGen, Inc., a small developer in Redmond, Wash., to provide shipping, inventory, purchasing and order-entry applications running on Informix relational databases and a suite of financial applications from Oracle that run on Oracle's Oracle Server rela-

tional database.

According to Watz, FourGen's software is designed so customers can modify the applications without changing the source code. This allows MCG to tailor FourGen applications to different business environments without losing the benefits of off-the-shelf software.

MCG developed a close partnership with FourGen so that many of Motorola's requirements get written into new releases of FourGen applications or development tools.

FourGen's software as well as the relational databases from Informix and Oracle run on Motorola's own Delta Series Unix processors running AT&T Unix Version 5.3. MCG will soon upgrade to Version 5.4, Watz said.

Currently, MCG has 25 Unix servers supporting about 1,000 X terminals on an Ethernet linked to a campus fiber backbone running Transmission Control Protocol/Internet Protocol. Another 10 Unix servers and 250 X terminals are located in a Dallas office, which is linked to Tempe via Motorola's corporate peer-to-peer network.

MCG has more than 100 other sites around the world — mainly sales offices — that will be linked

into the client/server network via dial-up lines or dedicated links, depending on traffic volumes.

Watz said that in addition to carefully choosing software, downsizing users also need to establish procedures and safeguards for protecting distributed data.

"Our production Unix systems need to be managed in a secure, controlled environment with proper procedures for data backup, storage, security and recovery, just as in the IBM mainframe environment," Watz said. "We can't afford a free-lance distribution of data."

MCG runs a dozen or more Unix servers in a single area so they can be more easily managed and controlled by trained systems administrators.

MCG is also developing a number of tools and operating procedures that will help it better manage a distributed Unix processing environment. These include automated backup and restoration programs that can work across a network and directory services that automate the task of establishing and changing user accounts on multiple servers, said Ken Ridgely, a network and systems manager at MCG. ■

Cadre intros open solutions

continued from page 19

database development life cycle, including data analysis, reverse engineering, forward engineering, design optimization and SQL code generation.

In addition to Oracle and Sybase database servers, DB Designer supports Informix Software, Inc.'s OnLine database, Ingres' database and DEC's Rdb. The standard SQL language ANSI SQL2 is also available to support other relational DBMSs.

DB Designer also takes advantage of industry-standard graphi-

cal user interfaces, providing capabilities such as an on-line tutorial, hypertext help, full windows support and spreadsheet-like graphical browsers.

In addition to supporting IBM's OS/2 Presentation Manager, Release 3.1 now works with HP's Open Look interface. A version for the Open Software Foundation, Inc.'s Motif interface is under development.

Release 3.1 for Sun is available now. The price for DB Designer, which varies depending on the options selected, begins at about \$20,000 for a package that includes both forward and reverse engineering. ■

Store & Forward

continued from page 19

4555 for more information.

Spinnaker Software Corp. recently announced Version 2 of Personal Access, a database query and reporting tool that now provides access to 16 major databases. The Microsoft Corp. Windows-based software has added support for databases from Ingres, Progress Software Corp. and Informix Software, Inc., as well as Novell, Inc.'s NetWare

SQL and IBM's OS/2 DataBase Manager.

Previous versions supported Oracle Corp.'s Oracle Server, Sybase, Inc.'s SQL Server and Novell's Btrieve.

Personal Access users can access IBM's DB2 via Micro Decisionware, Inc.'s Database Gateway. Users can access other added databases via Pioneer Software, Inc.'s Q+E Database Library. Version 2 costs \$695 but is available to Version 1 customers for \$199. Call (617) 494-1200 for more information. ■

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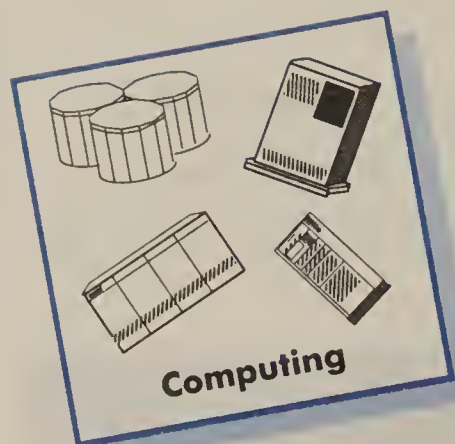
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INDUSTRY UPDATE

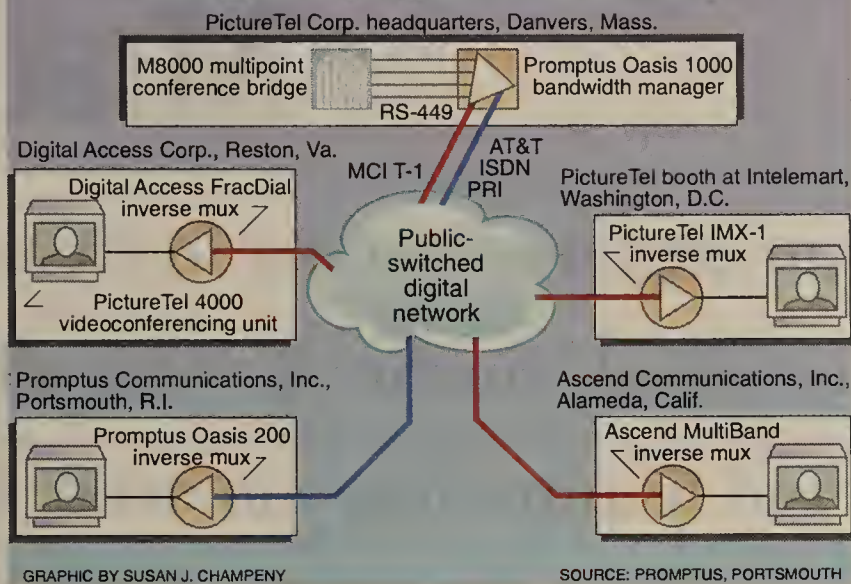
VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

Worth Noting

Syntellect, Inc., a Phoenix vendor of voice response systems, has completed its \$3.7 million acquisition of Dytel Corp., a Schaumburg, Ill., maker of voice processing systems.

Interoperability demonstration of inverse muxes

Using 6x56K bit/sec AT&T and MCI links



Makers of inverse muxes make interoperability push

Rush to support emerging BONDING specification.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — Four vendors of inverse multiplexer equipment are racing to market products based on an industry standard expected to be approved this month.

Convinced that interoperability is key to spurring user demand for inverse multiplexer equipment, Ascend Communications, Inc., Digital Access Corp., PictureTel Corp. and Promptus Communications, Inc. are basing their newly released products on a specification developed by the industry trade group, Bandwidth on Demand Interoperability Group (BONDING).

Providing interoperable inverse multiplexers will open up the market by allowing users to make capital commitments with the assurance that the equipment will work with goods from other vendors, said Peter Beck, chief executive officer of Digital Access in Reston, Va.

Inverse multiplexers, a recent development, enable customers to establish multiple switched digital links between two points and amalgamate the capacity for high-bandwidth needs. Without an industry standard, each vendor has vied for dominance by pushing a proprietary protocol.

The BONDING association was formed last September with the recognition that bandwidth-on-demand services will not reach their potential until users are able to establish dial-up links freely without fearing equipment

incompatibilities at either end of the call.

With surprising speed, the industry group has created a common specification, which has yet to be ratified but is already being implemented.

Digital Access began shipping a version of its FracDial inverse multiplexer supporting the BONDING specification in recent weeks. At about the same time, PictureTel released its IMX-1 product, developed under agreement with Promptus, manufacturer of the Oasis line. Ascend Communications plans to ship a version of its MultiBand Plus this month that will also support the BONDING specification.

The four vendors recently gave the first interoperability demonstration of BONDING-based equipment by setting up during the Intelmart show here a multipoint videoconference using 336K bit/sec facilities provided by AT&T and MCI Communications Corp. (see graphic, this page).

The demo suffered glitches, and the poor quality of the 30-minute videoconferencing session was blamed on the flaws that frequently occur in show networks, which are hurriedly constructed by vendors overnight. But the BONDING inverse multiplexer equipment established the videoconferencing call using both Integrated Services Digital Network and ordinary switched digital services without a problem.

(continued on page 28)

UN seeks backers for export trade centers

Network of int'l Trade Point Centers would ease exportation of goods, help developing countries.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — United Nations officials recently launched an effort to garner support for the construction of a networked system of 16 high-technology trade centers worldwide to help businesses export goods.

During their stop at the U.S. Department of State here, U.N. officials outlined a plan to build Trade Point Centers where businesses could list goods available for export in a database and where messaging, videoconferencing services and on-site government personnel and freight forwarders could help users through the complex export process.

The U.N. proposal received a warm welcome here, where Elizabeth Shelton, deputy director of the Office of International Economic Policy, said the Trade Point program may "perhaps be an opportunity for what has been

called 'doing well by doing good.' " She said the program would join the strengths of the private and public sectors, and benefit American businesses.

U.S. funding for the program is expected soon, and U.N. officials said they will be traveling to Japan and the European capitals to ask for support from governments there.

Jean Gurunlian, administrator in the Trade Facilitation Program at the Geneva-based U.N. Conference on Trade and Development (UNCTAD), said the creation of Trade Point Centers, outfitted as modern communications centers, would be of particular help in developing countries where businesses seldom have access to electronic data interchange or satisfactory telephone service.

"We want to put at the disposal of small companies information on trading," Gurunlian said. "We're looking to wake up potential trade," he emphasized. (continued on page 28)

INDUSTRY BRIEFS

Oracle posts strong financials. Oracle Corp., a Redwood City, Calif., database vendor, posted a 25% increase in revenue from \$287 million to \$360 million in the fourth quarter of its fiscal year, ended May 31. Earnings more than quadrupled to \$28.8 million for the quarter, up from \$5.5 million in the corresponding quarter of last year. Fiscal-year 1992 revenues increased 15%, to \$1.18 billion from \$1.03 billion for fiscal 1991. Earnings were \$61.5 million, a turnaround from a loss of \$12.4 million in fiscal 1991.

3Com, ICL sign OEM deal. 3Com Corp. has signed an OEM agreement with European computer giant ICL to resell 3Com's local-area network products. The agreement includes 3Com's NetBuilder internetworking products, CS 2000 terminal servers and LinkBuilder 3GH wiring hubs, as well as various net management wares. 3Com's products will become part of TeamWARE, ICL's line of personal computer-based LAN offerings.

The companies estimate the value of the multiyear OEM contract at \$10 million. Initial sales activities will be in Germany, Holland, Spain, the U.K. and the Nordic countries.

Teleos sets sights on overseas market. Teleos Communications, Inc., an Eatontown, N.J., vendor of network access equipment, last week unveiled a program to establish the usage (continued on page 28)

People & Positions

The **Digital Equipment Computer Users Society**, based in Shrewsbury, Mass., has named a new slate of officers.

Margaret Knox, associate director for Unix/VMS services at the University of Texas at Austin, was voted in as president. She is the first woman to be elected to the position in the organization's 31-year history.

Ralph Stamerjohn, a consultant at Wisconsin Data Laboratory, was elected vice-president.

Emily Kitchen, manager of information services at Dal-kon Shield Claimants Trust in Richmond, Va., was elected secretary-treasurer.

Reach Software Corp., a Cambridge, Mass., electronic mail vendor, has named **David Van Daele** to the newly created position of vice-president of sales. The company also appointed **Ron Quinn** as director of value-added reseller and independent software vendor sales.

Van Daele will be responsible for the development of Reach's reseller channel. Previously, he was vice-president and general manager of Digital Research, Inc.'s American Division.

Quinn, who will report to Van Daele, previously was director of distribution sales at Interactive Systems. ■

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Inverse mux makers push interoperability

continued from page 25

In late June, the BONDING members cast their ballots on whether to approve the inverse mux specification, which will form the proposed industry standard. The results of that vote will be revealed at the group's July 22 meeting.

Sources say several vendors have voted to support the proposed specification "with reservations," making it clear that the standards debate will continue. How-

ever, the four vendors in last week's demo said they will continue supporting the BONDING specification as it evolves. The group also intends to start developing BONDING conformance tests this month.

BT, the British-based carrier and manufacturer of videoconferencing equipment, recently joined BONDING, which has grown from half a dozen members at its inception to more than 30 today.

"We want to push them along the standards route," said Nigel Stevens, BT's product manager for videoconferencing in North America. ☐

UN seeks backers for export trade centers

continued from page 25

sized each Trade Point is planned as an open house. "It's not a place where you have to be a member," he said.

Gurunlian said the U.N. estimates that burdensome trade procedures account for 10% of the cost of trade between countries. By fostering the use of EDI, the Trade Point Centers would streamline the trading process. And at each center, designed for one-stop shopping in the export busi-

ness, officials from the host country's government and customs agency, as well as freight forwarding and banking firms would be on hand to help with the licensing and processing of goods.

Bruno Lanvin, head of the strategic planning unit at UNCTAD, said a trading center could exist either as one physical building or a "virtual center" of interconnected databases and computers, depending on each country's communications infrastructure.

The U.N. has already funded one center in Cartagena, Colombia, which opened earlier this year. It has proven to be so popular that the Colombian government has decided to establish another 13 Trade Points within the country, Gurunlian said.

The U.N. is now proposing a networked series of Trade Point Centers to be built at sites that may include Argentina, China, France, India, Ivory Coast, Kenya, Poland, Singapore, Sweden and Tunisia, as well as Ohio. The new Trade Points are envisaged as part of a system that would enable the sharing of trading data.

Gurunlian said that more than 70 countries have already asked the U.N. for Trade Point Centers. He said the U.N. has about \$16 million to spend over two years on the project, but more funding and technical support is needed from both the private and public sectors.

Gurunlian also said an international effort to create organizational and legislative models for the Trade Points is also needed to protect confidential data, smooth administration interaction and foster dispute resolution.

Greg Harter, president of the Electronic Data Interchange Association (EDIA), who attended the State Department briefing, said his organization is developing an education proposal associated with the Trade Point program that would send a team of computer specialists and equipment to Africa, Asia, Eastern Europe and Latin America. There, the EDIA team would educate users about everything from the fundamentals of computer use to EDI implementation.

"I want to see this used as a catalyst for competition in the U.S. and other countries by being EDI-able," Harter said. ☐

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Capital Markets

Industry Briefs

continued from page 25

and availability of its products overseas. Teleos has worked with in-country terminal adapter makers to test for interoperability of the terminal adapters and Teleos' VideoHub products. In the first quarter of 1993, Teleos will seek certification of its VideoHub and multiapplication Network-Hub products by overseas telecommunications authorities. Teleos also announced that it has developed its Project Implementation Planning Service to include global net design and implementation support.

On the domestic front, Teleos signed five new distributors: Ficomp, Inc., Logos Communications, Inc., RGdata, Inc., Telcorp. and Western Data Group, Inc.

Unix International signs Lotus. Unix International, Inc. announced that Lotus Development Corp. has joined its ranks and will participate in developing Unix V and related system software. ☐

MANAGEMENT STRATEGIES

ENTERPRISE NETWORK STRATEGIES, USER GROUPS AND MANAGING PEOPLE AND TECHNOLOGY

Worth Noting

“Groupware is a wonderful theoretical concept, but when you try to implement it, you can run into some real problems because of the multivendor nature of most user networks.”

Jamie Lewis
Editor in chief
Clarke Burton Report
Salt Lake City



NCR's electronic voting system to be used at the convention.

New technology wins votes at Democratic Convention

AT&T behind the scenes putting innovation to use.

By Wayne Eckerson
Senior Editor

NEW YORK — The Democratic National Convention this week will showcase an array of advanced information technologies to support over 40,000 convention-goers and journalists here.

AT&T, which is the Democratic National Convention's official technology and long-distance provider, will string Madison Square Garden with more than 180 miles of telephone cable, including multiple T-1 lines going into about 150 satellite trailers parked outside the Garden.

In addition, AT&T and its subsidiary, NCR Corp., will supply a touch-screen electronic voting unit to each state delegation, several AT&T microcellular transmitters to support cellular communications within the Garden and a central office-based facsimile gateway, among other things.

Nynex Corp. will provide four videoconferencing units that will enable top Democratic party officials to conduct face-to-face electronic meetings with one another from several offices and suites within the Garden.

Installing all of this technology on time and within budget has been a Herculean task that has fallen on the shoulders of Roger Schneider, director of technology for the Democratic National Convention.

“Politics is a strange beast, and when you mix it with technology, which is also volatile, you have nitroglycerin on your hands,” he said. “I’ve had to use technology to solve problems caused by the explosion of technology this year.”

Schneider is using a computer-aided design package from AutoDesk, Inc. as well as Hewlett-Packard Co. plotters to keep track of seating assignments and telephone lines used by state delegations and the media.

In addition, to support his 200-person staff, Schneider has installed a Microsoft Corp. LAN Manager local-area network to handle administrative tasks associated with deployment of AT&T technology and services.

Among its projects, the staff has had to implement 56 touch-screen electronic voting systems. Each delegation will use the units to record their yes, no or abstain votes on a variety of issues, the results of which are tallied and broadcast on large overhead video screens in the Garden.

All of the voting units are linked to an NCR 3B Unix server, which also supports four personal computers located at the speaker's podium. Trained convention officials can use the PCs to frame questions to be voted on in response to resolutions issued from the convention floor.

Schneider said NCR designed the voting system so that anyone without training can operate it.

Rather than ban cellular phones, the Democratic National Convention asked AT&T to install microcellular transceivers with low-powered operations that don't interfere with microphones and other electronic equipment, Schneider said. AT&T will provide four Lightwave Microcell Transceivers, which will be mounted on walls inside the Garden and support as many as 160 simultaneous conversations. ■

GUIDELINES

BY STUART BROTMAN

The art of negotiating in recessionary times

Although the U.S. remains stuck in one of the country's most persistent recessions ever, that can be good news for net managers looking to sign deals with telecommunications vendors.

The recession has created a buyers' market in the telecommunications industry. But net managers who don't know how to negotiate effectively in this climate won't succeed in winning the most favorable deals possible.

The following are some key points for network managers to consider when negotiating deals in recessionary times.

■ **The role of negotiation expands in a recession.** In a recession, vendors are eager for new business, making virtually every aspect of a deal open for discussion. Vendors that walked away from a negotiation several years ago now seem more willing to listen to counteroffers from users.

In this buyers' market, net managers should press vendors for the best terms possible. Salespeople will say they are flexible about pricing and features but won't provide details unless pushed to do so. Make sure vendors spell out the specific terms they are willing to adjust in your favor.

■ **Negotiation authority needs to be expanded.** Traditionally, user companies have a short list of managers who are authorized to sign off on a deal, even though others might be involved in the negotiations. This hierarchical approach works fine when the terms subject to negotiation are limited, but in today's economic climate, such an approach can be a liability.

Broadening negotiating authority allows more people to bargain more often, increasing the chances that favorable deals will be put on the table. Of course, senior managers need

to reserve the right to sign off on deals involving large sums of money.

■ **Negotiation alternatives need to be considered carefully.** It is important to understand in advance what you are willing to do if you can't reach an agreement with a particular party. What other vendors can be brought in and what terms might they negotiate? If you can't reach an agreement with a vendor, you should have alternative vendors lined up and ready to negotiate. Having acceptable alternatives puts you in a stronger bargaining position.

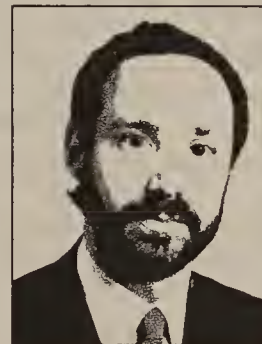
■ **Negotiation efficiency must be improved.** Because time is money, the need to set and adhere to strict time limits for negotiations is critical. Managers can reinforce this point by awarding bonuses to employees who achieve

the best negotiating results in the least amount of time. They can also ensure better internal negotiating efficiency by viewing negotiation as a continuing company development process. Staff meetings and training sessions on negotiation techniques can increase negotiating efficiency.

■ **Recessions aren't forever.** Viewed positively, today's downturn is the first step in tomorrow's recovery. The deals you strike and the relationships you establish now will be remembered when the pendulum swings again.

It's tempting to take advantage of the moment, but in the end, those who continue to adhere to a “win-win” philosophy in negotiations are the ones who will prevail long after the current economic crisis has faded away. ■

Brotman is a Boston-based communications lawyer and management consultant.



Manager Minutes

The MIS Training Institute will hold its 12th Annual Conference on Control, Audit & Security of Information Systems Oct. 12-15 in Chicago.

The conference is designed to explore the audit and security issues surrounding multiplatform networks and will concentrate on the risks of downsizing mission-critical applications from mainframes to distributed architectures.

The conference will feature more than 70 sessions on strategies for managing multiplatform nets as well as eight daylong tutorials on a variety of topics.

For more information, contact Pam Bissett at (508) 879-7999.

The Yankee Group will hold its third annual outsourcing summit meeting, titled “Smartsourcing: The Users Speak,” July 28 and 29 at the Marriott Long Wharf in Boston. The meeting will focus on the concept of “smartsourcing,” or choosing the right functions to outsource, and will feature several Yankee Group customers discussing their experiences.

For more information, contact Betsy Gray at (617) 367-1000. ■

BUSINESS PROCESS REDESIGN

BY MICHAEL FARABELLI

Net managers can seize the moment with reengineering

Today's network managers, whether they handle voice and data wide-area communications or local client/server nets, are in a unique position to get strategic by jumping on the reengineering bandwagon.

Managers in Fortune 500 boardrooms around the country are undertaking reengineering projects. It behooves network staff to take part in those projects from the start. Network staff can clearly explain to upper management the benefits that hot technologies such as wireless data communications, graphical user interfaces, voice response, client/server computing and imaging can bring to a reengineering project.

Becoming involved from the onset will give net managers an opportunity to shape process designs and affect the selection of technology and, hence, move their careers forward. But becoming proactive in the reengineering process requires a certain course of action from net professionals.

They need to become well versed in reengineering concepts such as process value analysis, which forces managers to identify value-added and non-value-added activities asso-

ciated with a process in order to minimize the impact of non-value-added activities. Net managers should also become familiar with change management, which involves fighting end-user resistance to new technologies or processes with strong training, education and reward systems.

Network personnel can set a reengineering example by streamlining and radically improving their own processes. Net operations centers and communications administration offices are ideal candidates for quick reengineering efforts that could give networking personnel credibility within an organization.

It is also imperative that network professionals keep up with potential breakthrough technologies so they can proactively work with end-user groups to bring those technologies to bear on end-user processes. Network managers should develop a net technology assessment plan that includes descriptions of emerging technologies, their forecasted feature and pricing trends, potential uses for them, management tools and an expected payback period. Sometimes reengineering efforts promise shorter payback periods that can actually be delivered, and net managers can help greatly in educating end users and executive management about the facts of that payback period.

Furthermore, network managers and technicians should augment their technical knowledge by learning as much as possible about the key business processes used in their companies. If you are involved in the retail industry, for example, then you must understand the best way to support point-of-sale and retail logistics, such as warehousing merchandise, ordering stock from suppliers and controlling inventory. You can't understand or even define innovation if you don't understand the basic practices of your industry.

The time has never been better to make networking strategic. It is up to net professionals to seize the moment. ■

Farabelli is a partner at Ernst & Young, a consulting firm in Washington, D.C.

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EDITORIAL

Novell should put customers' interests ahead of its own

LAN software giant Novell, Inc. may have left users of its NetWare network operating system in the lurch because it wasn't clear about its product plans.

For years, Novell guided users by saying its NetWare 2.X versions were appropriate for work group networks and NetWare 3.X would provide enterprise connectivity.

But recently, the other shoe dropped when Novell disclosed that enterprise connectivity features, such as security, distributed directory services, and System Fault Tolerance (SFT) Level III will ship with NetWare 4.0 and not as an option for NetWare 2.X or 3.X.

That means users that want those features will have to mi-

grate to NetWare 4.0. For NetWare 2.X users, that would likely represent a very steep financial burden, even if NetWare 4.0 costs just 25% more than NetWare 3.2, as expected.

NetWare 3.X customers, meanwhile, may be feeling a bit misled. All along, Novell has been crafty with its wording about SFT III. "We didn't promise that SFT III would run on 3.11," said Bob Young, director of marketing for Novell's NetWare Products Division. "We might have implied that."

Novell claims none of its users are disgruntled over its decision to offer enterprise connectivity features with NetWare 4.0 and that users needing them will migrate to NetWare 4.0 anyway.

But there's a bigger issue.

Novell should make product plans clear well in advance so users can map out migration strategies without the specter of being forced to repeatedly upgrade. Furthermore, with NetWare 4.0, Novell appears to be wrapping advanced features into a premium-priced package. But those features are also needed by users with older NetWare versions.

Novell has overlooked the best interests of NetWare users long enough. The only way to get Novell to listen is to lobby it to offer advanced features as options for existing NetWare versions. So send us a letter about this issue, and we'll print it alongside others in an effort to make sure Novell addresses your concerns. ■

OPINIONS

MACROSCOPE

BY JAMES KOBIELUS

Developing a communications learning strategy

Formal technical training, such as graduate school or a university certificate program, is an important factor in the success of network professionals, but it's no magic pill. To succeed in this industry, you must have an aggressive learning strategy that relies mostly on your own resources and initiative.

There's too much happening in this industry for classroom training alone to represent a total solution for our personal knowledge deficits. Even at its best, formal training provides general information that may be nearly obsolete while it's still fresh in our minds.

Network professionals often feel overwhelmed by the pace of change in the communications industry, so much so that you clutch at every training opportunity as if it might be the key to our professional survival. But that's the wrong attitude to have. The most effective, flexible network professionals are mostly self-taught.

Net managers can adopt a learning strategy that costs little and produces near-immediate results.

One obvious path to take is to seek professional challenges. Try something you've never done before, and don't be too picky. If you've been pulling cable and wiring punchdown blocks for 20 years, try your hand at technical writing. If you've established yourself as the staff guru on IBM's Systems Network Architecture, take a plunge into the world of Unix and Transmission Control Protocol/Internet Protocol networking. You'll never know what you're capable of unless you take a stab at it. Otherwise, you risk being pigeonholed into marginal jobs with few opportunities for advancement.

You should also surround yourself with smart, well-in-

formed people. The quickest way to assimilate a new topic is to talk to as many technical experts and vendors as possible. In so doing, you'll be expanding your circle of technical contacts, gaining familiarity with new terminology and picking up on the important trends and issues in your chosen new specialty. Communications trade shows and user groups are good places to acquaint yourself with a new technical community.

Furthermore, be ready to ask stupid questions. Always ask at

The most effective, flexible network professionals are mostly self-taught.



least one technical question of every expert you encounter, no matter how mundane the topic or intimidating the expert. Resist the urge to fall silent in the presence of technical cognoscenti.

The only way to flesh out a new topic in your mind is to keep asking pertinent questions. None of us were born with an understanding of gigabit networks, transport-level protocols and link-state algorithms.

Another good strategy is to read everything. You can gorge yourself on product literature, trade magazines, technical journals and reference books. If you have trouble finding time to read, sacrifice your lunch break or spend an hour or two reading at home every night. Don't worry if you can't remember every detail about every company, technology, standard or prod-

uct. Read for familiarity with the big industry trends and issues.

In addition, build a personal library. Keep a copy of everything you've read in the past year or two that looks like it might be even remotely relevant to some future endeavor. Also, make the information easy to find. The key to success in this industry is knowing where to find the information you need when you need it.

Your personal library need not be fancy; mine is stored in a half-dozen or so plastic milk crates in my home office closet. Depending on your financial and technical resources, you may want to turn your physical library into a virtual library by subscribing to industry on-line news services or CDRom-based technical databases.

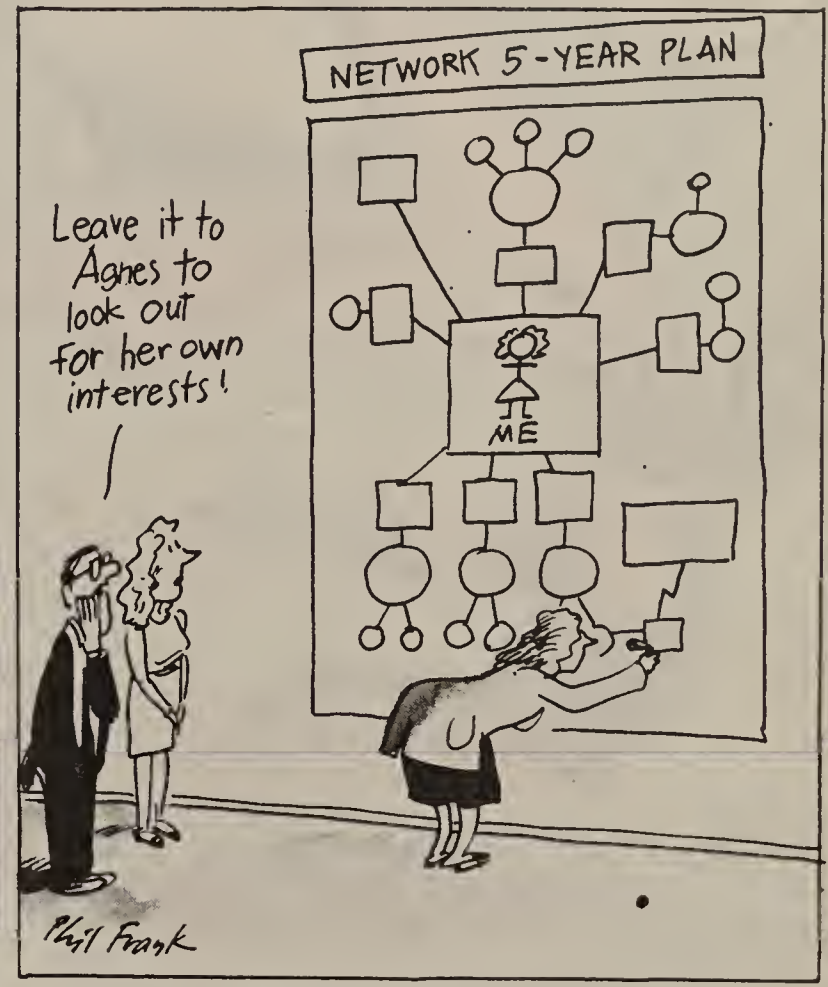
Finally, show the world your newfound expertise by writing or speaking on the topic, either within your work group or — if you are so inclined — for the trade press or at a conference. Public writing or speaking will crystallize your thinking and validate your status as a technical expert. Use each article or speaking engagement as an excuse to engage in prior research into a specific topic.

Knowledge is everywhere if you know how to harvest it. Most of what you need to know can be learned on the job, by hook or by crook. Don't stop asking your employer to provide you with formal training, but try not to make that the be-all and end-all of your professional growth strategy. ■

Kobielus, a contributing editor to Network World, is a telecommunications analyst with Fairfax, Va.-based Network Management, Inc., one of the largest local-area and wide-area network systems integrators in the U.S.

TELETOONS

BY FRANK AND TROISE



LETTERS

The impossible dream?

I'm writing in response to your recent article, "LAN users find you still can't get there from here" (NW, June 29).

That article stated, "Sharing printers is the impossible dream, especially for Macintosh users."

What? Run that by me again? Printer sharing is the norm for Macintosh users. With a truly shared printer, you do not need a network operating system server to act as a middleman — you talk to the printer directly.

Most of the printers that are truly shared speak PostScript on Apple Computer, Inc. AppleTalk local-area networks.

How can you possibly make the implication that Macintosh printers are incompatible with all the major network operating systems when it's the other way around? Most network operating systems cannot communi-

cate with the majority of the world's existing shared printers.

It is trivial for Unix, DOS and Microsoft Corp. Windows computers to print to PostScript printers. They do it all the time.

Many of them do it via AppleTalk protocols on AppleTalk LANs. Go to any photocopier/rent-a-computer store and you'll see shared printers and phototypesetters connected via AppleTalk and accepting images via PostScript.

The impossible dream is figuring out how to force printing through all the major network operating systems when the majority of the world's shared printers don't need any of the major network operating systems.

Kee Nethery
Kagi Engineering, Inc.
Berkeley, Calif.

(continued on page 47)

Do you disagree with an article you've read in Network World? Write us a letter about it.

Hard copy should be typed, double spaced and mailed to Editor, Network World, 161 Worcester Road, Framingham, Mass. 01701 or faxed to (508) 820-3467. If you prefer, letters can be sent via MCI Mail at 390-4868 or uploaded to our Bulletin Board System. (See page 2 for BBS instructions.)

Letters may be edited for space and clarity.

ATTENTION TEST EQUIPMENT VENDORS: *Network World* would like to list your product in a Buyer's Guide being published Aug. 31. This Buyer's Guide will cover both local- and wide-area protocol analyzers. It will not cover equipment such as time-domain reflectometers and breakout boxes.

To obtain a survey form, call Charles Bruno, features editor, at (508) 820-7414. We must receive your request for a survey form by Friday, July 17.



ONE MINUTE, IT'S A SLOW CURSOR. THEN, A SLOW PRINT QUEUE. NEXT THING YOU KNOW, IT'S SLOW E-MAIL. SLOOOOOOOOOOW FILE ACCESS. AND SLOOOOOOOOOOOOOOW LOG-ONS.

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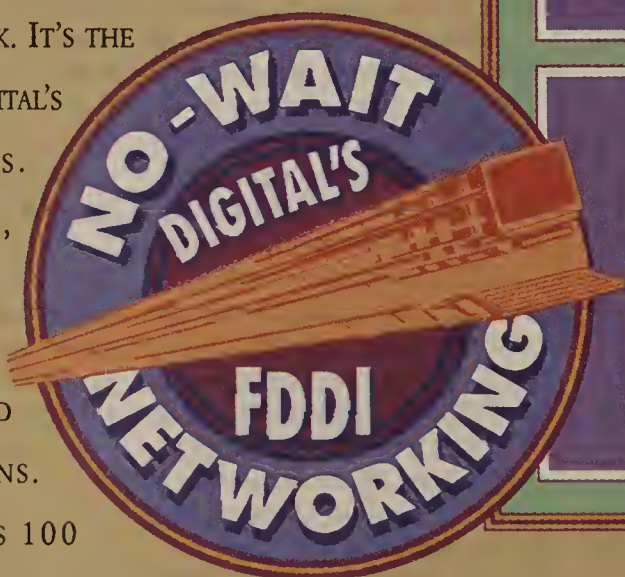
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DISASTER RECOVERY

AND BACKUP

LAN backup programs get smart

Software intelligence automates backup tasks, taking a load off the network manager.

Network managers in the market for LAN backup software are in for a surprise: Increasingly, vendors don't want you to use their products.

Instead, the trend among providers of local-area network backup software — especially at the high end of the market — is to add intelligence to their products and make them easier to use so network managers can offload backup chores to clerks rather than devote their own time to the chore.

Buyers should also expect to find a flood of file and resource management features that allow net managers to make better use

of costly storage subsystems by moving underutilized files off-line to free up disk or tape capacity.

The range of LAN backup options has expanded dramatically in the past few years, as has the complexity of the backup process. Users now have new storage subsystems such as digital audio tape (DAT) drives and 8mm tape systems, as well as the ability to back up remote nodes and local units.

With gigabytes of data and tens of thousands of files now the norm on many LANs, designing an effective backup system is more than just attaching a tape

drive to the server.

Hardware, such as tape drives, and procedures, such as off-site backup, are still critical components of LAN backup strategies. But increasingly, it is the LAN backup software that determines what hardware is usable and what procedures are possible.

"Outline your requirements for tape backup, find software

that can fulfill those needs, then purchase hardware that is unquestionably compatible with that software," recommends Marty Fletcher, manager of product marketing at Maynard Electronics, Inc.

Surprisingly, even the best LAN backup software costs only a few hundred dollars. While there is a low end of the market in the form of DOS-based backup utilities, high-end systems typically are server-based and come packaged with a sophisticated disk, tape or other backup system.

At the high end of the market, LAN backup software provides so-

(continued on page 37)

CHART • GUIDE

A Buyer's Guide chart detailing LAN backup programs begins on page 36.

By JEFF UBOIS

Token Ring hubs meet your most

Networks change. It is this simple truth which has shaped our philosophy on Token Ring hub design. First there is our



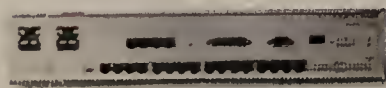
The 2705 Token Ring hub.

2705 hub. It connects

up to 16 nodes

with simple, terminal-based management.

But small networks grow. And management needs grow more complex. Enter our 2715 hub. It can manage up to four of our 2705 hubs

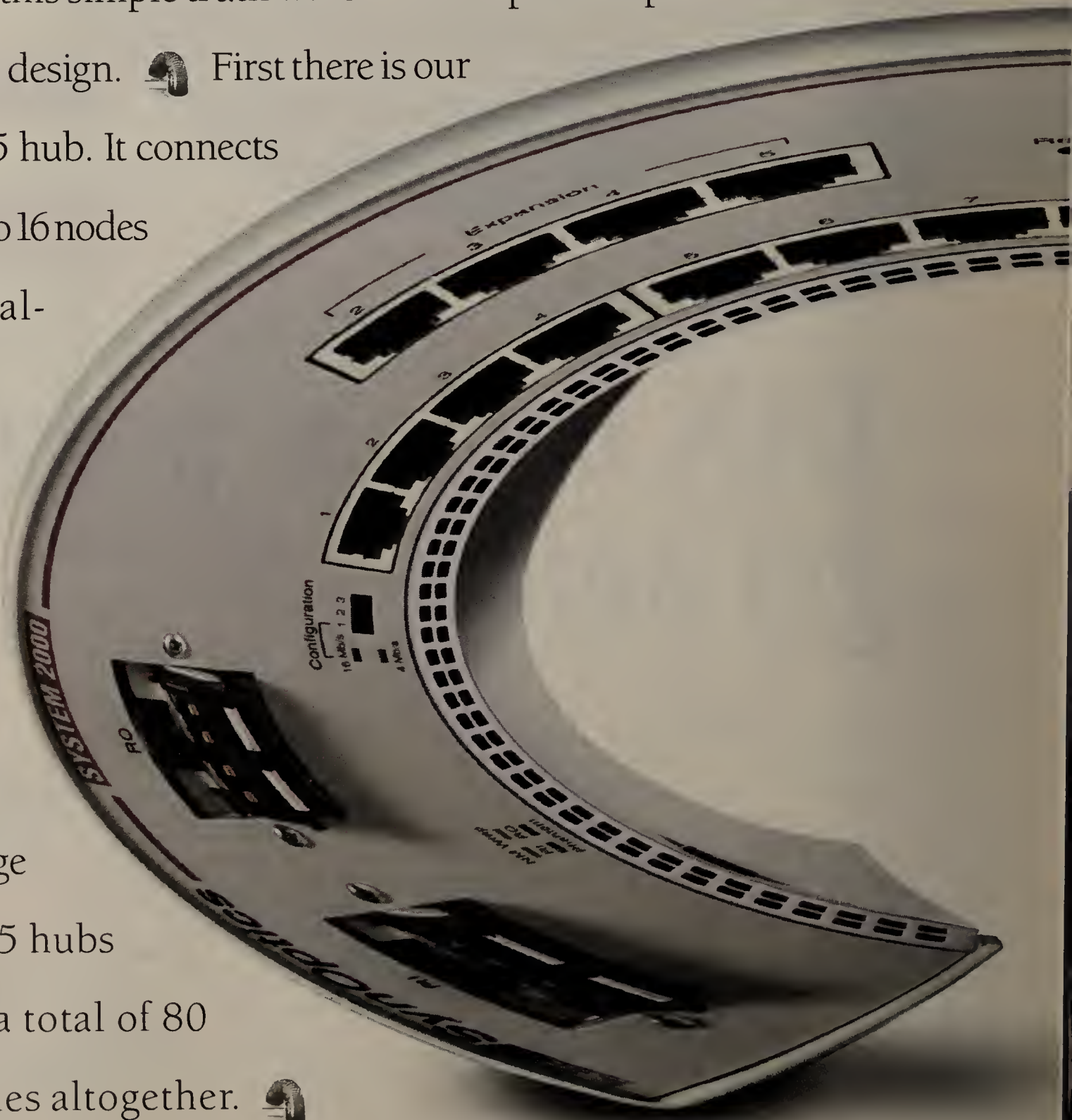


The 2715 managed Token Ring hub.

for a total of 80

nodes altogether.

It doesn't stop there. For high-density, multiple-access environments we offer our formidable System 3000 hub. We also have



Call 1-800-PRO-NTWK, ext. 37 for more information, or write, and we'll be

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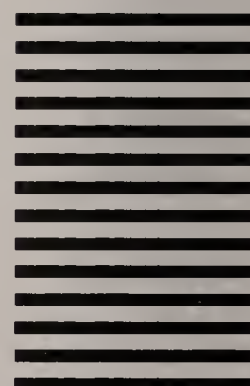


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flexible enough to rigid standards.

the first 16 Mb/s UTP Token Ring solution co-developed with

IBM for assured interoper-

ability. And all our

hubs are

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on



The System 3000 managed
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SNMP standards.



So you can


begin with a

small, entry-level

network, and build


it into a large, fully-

managed network. All

for under \$200/node.  Be-

cause at SynOptics, we believe that flexi-

bility in Token Ring solutions is paramount. It's

the one point on which we refuse to bend.  **SynOptics**

ver backwards for you. By the way, our GSA number is GS00K-92-AGS-5494.

LAN backup programs

Company	Product	Hardware platform	File systems supported	Network operating system support						Min. memory required (bytes)	Max. storage capacity (bytes)	Device support	Backup options										Restore options	Reports	File management	Novell SMS support	Price	Warranty
		W = Workstation S = Server O = Other	D = DOS M = Apple Macintosh U = Unix O = Other	Microsoft LAN Manager	IBM LAN Server	Novell NetWare 286	Novell NetWare 386	Banyan VINES	Other				Copy-protected files	Full	Hidden files	Incremental	Open files	Data compression	Auto backup of multiple files	Unattended backup	Backup of remote disks	Other						
Central Point Software, Inc. (800) 445-4208	Central Point Backup 7.1 for DOS and Windows	W	D			✓	✓			2M for Windows, 640K for DOS	V	F, H, T, O	✓	✓	✓	✓	✓	✓	✓	✓	✓	D, F, S, O	B, F, H	Y	N	\$129	60 days	
	Central Point Backup 7.2 for Windows	W	D			✓	✓			2M	V	F, H, T, O	✓	✓	✓	✓	✓	✓	✓	✓	✓	D, F, S, O	B, F, H	Y	N	\$129	60 days	
Cheyenne Software, Inc. (516) 484-5110	ARCserve	S	D, M, U			✓	✓			200K	180K	D, F, H, T, W	✓	✓	✓	✓	✓		✓	✓	✓	F, S, O	B, H	Y	Y	\$295+	30 days	
Colorado Memory Systems, Inc. (800) 845-7905	Jumbo 120	W	D, M, U	✓		✓	✓		✓	512K	120M	T		✓	✓	✓		✓	✓	✓	✓	D, S, O	O	N	N	\$250	60 days software, 1 year hardware	
	Jumbo 250	W	D, M, U	✓		✓	✓		✓	512K	250M	T		✓	✓	✓		✓	✓	✓	✓	D, S, O	O	N	N	\$350	60 days software, 1 year hardware	
	QFA-700	W	D, M, U	✓		✓	✓		✓	512K	700M	T		✓	✓	✓		✓	✓	✓	✓	D, S, O	O	N	N	\$1,590	60 days software, 1 year hardware	
Dantz Development Corp. (510) 849-0293	Retrospect Remote	W, S	M						✓	1M	10T	D, F, H, T, W, O	✓	✓	✓	✓	✓	✓	✓	✓	F, S	B, H	Y	N	\$449	60 days		
Delta Microsystems, Inc. (510) 449-6881	BudTool Backup and Retrieval Software	W, S	U	✓	✓					NA	580G	D, H, T, W, O	✓	✓	✓	✓	✓		✓	✓	✓	D, F, S	B, O	Y	Y	\$4,995	NA	
Distinct Corp. (408) 741-0781	Distinct Backup for Windows	W	D	✓		✓	✓	✓		1M	V	F, H, W, O		✓	✓	✓		✓	✓	✓		D, F, S	F, O	N	N	\$129+	60 days	
EFI Electronics (800) 877-1174	LanGarde 400	W, S	D, M, U	✓	✓	✓	✓	✓	✓	339K	NA	NA							✓			O	F, O	N	Y	\$499	Lifetime	
Emerald Systems Corp. (800) 767-2587	Xpress Librarian 2.0	W	D, M			✓	✓			2M	V	D, T		✓	✓	✓	✓		✓	✓	✓	F, S	B, F, H, O	Y	N	\$995	1 year	
	EmSave	W	D, M			✓	✓			640K	V	D, T		✓	✓	✓	✓		✓	✓		F, S	B, F, H	Y	N	\$395	1 year	
Emeritus Technologies (800) 228-9236	TapeWare DOS/NWS	W, S	D, M, U			✓	✓			1M	5G	D, H, T, W		✓	✓	✓		✓	✓	✓	✓	D, F, S	B, F, H	Y	N	\$195	1 year	
	TapeWare LAN/286	W, S	D, M, U			✓	✓			1M	5G	D, H, T, W		✓	✓	✓		✓	✓	✓	✓	D, F, S	B, F, H	Y	N	\$695	1 year	
	TapeWare LAN/386	W, S	D, M, U			✓	✓			1M	5G	D, H, T, W		✓	✓	✓		✓	✓	✓	✓	D, F, S	B, F, H	Y	N	\$1,295	1 year	
Fifth Generation Systems, Inc. (800) 873-4384	Fastback Network	W	D			✓	✓			1M	2M	D, F, H, T, W		✓	✓	✓	✓	✓	✓	✓	✓	D, F, S	B	Y	N	\$225	1 year	
	Untouchable Network	W, S	D	✓	✓	✓	✓	✓		512K	1M	NA										NA	O	N	Y	\$695	1 year	
	Direct Access Network	S	D	✓	✓	✓	✓	✓		256K	2M	NA										NA	O	N	Y	\$595	1 year	
FortuNet, Inc. (801) 467-6887	NSure	W	D	✓		✓	✓			540K	V	D, F, H, T	✓	✓	✓	✓		✓	✓	✓		F, S	B, F, H	Y	N	\$895	30 days	
Gazelle Systems, Inc. (800) 786-3278	Back-It 4 LAN	W	D	✓		✓	✓	✓		280K	V	D, F, H, T		✓	✓	✓		✓	✓	✓	✓	D, S	B	N	Y	\$295	60 days	
GigaTrend, Inc. (619) 931-9122	MasterDat	W, S	D, M, U			✓	✓			512K	5G	D, T		✓	✓	✓		✓	✓	✓	✓	F, S	B, H	Y	Y	\$7,450+	1 year	
	ServerDat	S	D, M, U			✓	✓			800K	5G	D, T		✓	✓	✓		✓	✓	✓	✓	F, S	B, H	Y	Y	\$5,950+	1 year	
	LanDat	W	D, M			✓	✓			512K	5G	D		✓	✓	✓		✓	✓	✓		F, S	B	Y	N	\$4,650+	1 year	
Legato Systems, Inc. (415) 329-7880	Networker NetWare Version	S	D, M, U				✓			4M	V	D, T, W		✓	✓	✓	✓	✓	✓	✓	✓	F, S	NA	Y	Y	\$2,300	6 months	
	Networker Unix Version	S	D, M, U						✓	NA	V	D, T, W		✓	✓	✓	✓	✓	✓	✓	✓	F, S	NA	Y	Y	\$2,000	6 months	
Maynard Electronics, Inc. (800) 821-8782	ArchiveVP with QICstream 4.0	W	D, M, U			✓	✓		✓	512K	250M	T		✓	✓	✓	✓		✓	✓	✓	F, S, O	B	N	Y	\$995+	1 year	
	ArchiveXL with QICstream 2.0XL	W	D, U			✓				384K	120M	T		✓		✓		✓	✓	✓	✓	S, O	NA	N	N	\$499+	1 year	
	LANStream	S	D, M			✓	✓			1M	5G	D, O	✓	✓	✓	✓	✓		✓	✓	✓	F, S	B, F, H, O	Y	N	\$595+	1 year	
	MaynStream NLM	S	D, M			✓	✓			1M	5G	D, T, O	✓	✓	✓	✓	✓		✓	✓	✓	F, S	B, F, H	Y	N	(1)	1 year	
	MaynStream for DOS	W	D, M			✓	✓			512M	5G	D, T, O	✓	✓	✓	✓	✓		✓	✓	✓	F, S	B, F, H	Y	N	(1)	1 year	
	MaynStream for OS/2	W, S	D, O	✓	✓					1M	5G	D, T, O	✓	✓	✓	✓	✓		✓	✓		F, S	B, F, H	Y	N	(1)	1 year	
	MaynStream for Windows	W	D, M			✓	✓			1M	5G	D, T, O	✓	✓	✓	✓	✓		✓	✓		F, S	B, F, H	Y	N	(1)	1 year	
	Irwin EZTape for DOS	W	D			✓	✓			640K	2.3G	T	✓	✓	✓	✓		✓	✓	✓		D, F, S	B	Y	N	\$129+	1 year	

LAN backup programs

Company	Product	Hardware platform	File systems supported	Network operating system support						Min. memory required (bytes)	Max. storage capacity (bytes)	Device support	Backup options										Restore options	Reports	File management	Novell SMS support	Price	Warranty
		W = Workstation S = Server O = Other	D = DOS M = Apple Macintosh U = Unix O = Other	Microsoft LAN Manager	IBM LAN Server	Novell NetWare 286	Novell NetWare 386	Banyan VINES	Other			D = Digital audio tape F = Floppy H = Hard disk T = Tape W = WORM O = Other	Copy-protected files	Full	Hidden files	Incremental	Open files	Data compression	Auto backup of multiple files	Unattended backup	Backup of remote disks	Other						
Maynard Electronics (continued)	Irwin EZTape OS/2 Presentation Manager	W	D, O	✓	✓	✓	✓		1M	2.3G	T	✓	✓	✓	✓		✓	✓	✓		D, F, S	B	Y	N	\$269	1 year		
	Irwin EZArc 4.0 NLM	S	D, M, U			✓	✓		640K	2.3G	D, H, T, W	✓	✓	✓	✓		✓	✓	✓		F, S	B, F, H	Y	Y	\$349+	1 year		
Mountain Network Solutions, Inc. (800) 458-0300	FileSafe	W	D, M, O	✓	✓	✓	✓		640K	8G	D, T	✓	✓	✓	✓	✓	✓	✓	✓		D, S	B	Y	N	\$495	1 year		
Nonstop Networks, Ltd. (212) 481-8488	No*Stop Network	W	D, U	✓	✓	✓	✓	✓	9K	NA	H, W	✓	✓	✓	✓	✓	✓	✓	✓		NA	NA	N	Y	\$1,290+	1 year		
Novell, Inc. (800) 638-9273	SBackup	S	D, M, U, O			✓	✓		350K	V	F, H, T, W, O	✓	✓	✓	✓	✓		✓	✓		S	B	N	Y	(2)	(3)		
Palindrome Corp. (708) 505-3300	Network Archivist	W, S	D, M			✓	✓		512K	V	D, F, T, O	✓	✓	✓	✓	✓	✓	✓	✓		D, F, S	B, F, H	Y	N	\$995	90 days		
PCX (800) 729-7378	BakupWiz	W	D, M			✓	✓		512K	V	D, F, H, T		✓	✓	✓	✓	✓		✓		S, O	B	N	N	\$149	90 days		
Performance Technology (512) 349-2000	PowerSave 2.22	W	D	✓	✓	✓	✓	✓	350K	5G	D, T		✓	✓	✓	✓	✓	✓	✓		S, O	O	N	N	\$1,995	90 days		
Shany, Inc. (310) 204-0111	Disk+	W	D	✓	✓				8K	V	H							✓		O	O	N	N	\$295+	30 days			
SitBack Technologies, Inc. (800) 873-7482	SitBack for Networks	W, S	D	✓	✓	✓	✓	✓	19K	V	F, H, W, O		✓		✓		✓	✓	✓		D, S	B, F, H	Y	Y	\$395+	30 days		
Symantec Corp. (800) 441-7234	Norton Backup 2.0 for DOS	W	D	✓	✓	✓	✓	✓	512K	2M	F, H, T	✓	✓	✓	✓	✓	✓	✓		F, S	B, F	N	N	\$149	60 days			
	Norton Backup 2.0 for Windows	W	D	✓	✓	✓	✓	✓	2M	4M	F, H, T	✓	✓	✓	✓	✓	✓	✓		F, S	B, F	N	N	\$149	60 days			
Sytron Corp. (508) 898-0100	Sytos Plus for DOS	W	D			✓	✓		640K	2.3G	D, F, H, T		✓	✓	✓		✓	✓	✓		F, S	B, F, H	Y	N	\$225	90 days		
	Sytos Plus for OS/2	S	D	✓	✓				(4)	2.3G	D, F, H, T		✓	✓	✓		✓	✓	✓		F, S	B, F, H	Y	N	\$295	90 days		
Tailgrass Technologies Corp. (800) 825-4727	NetSecure	S	D, M, U			✓	✓		280K	48G	D, T, O		✓	✓	✓		✓	✓	✓	✓	D, F, S	B, F, H	Y	Y	\$295+	2 years		
	FileSecure Enterpriz	W	D			✓	✓	✓	640K	48G	D, T, O		✓	✓	✓		✓	✓	✓	✓	D, F, S, O	B, H, O	Y	N	\$795	2 years		
Vortex Systems, Inc. (412) 322-7820	TC376 Storage Management System	S	D, M, U	✓	✓		✓	✓	200K	4G	H, T, O	✓	✓	✓	✓	✓	✓	✓	✓	O	O	N	N	\$10,995	1 year			

NA = Not applicable
SMS = Storage Management Services

FOOTNOTES:
(1) Under firm's Superbundle promotion, buyer receives this package free with purchase of MaynStream 525M- to 5G-byte Small Computer System Interface-based drive (for a limited time only).
(2) Free with NetWare Version 3.11.
(3) Covered by standard NetWare 3.11 warranty.
(4) OS requirements plus 1M byte.

SOURCE: NETWORK WORLD

(continued from page 33)
phisticated file management in addition to backup and restore options. Unattended backup, file-by-file restoral, cataloging and backups of nodes from the server, once considered advanced features, are now typical requirements. Features that let administrators customize their backups, such as scheduling, scripting and rules-based engines, have also become necessities.
Low-end packages, which often run on DOS workstations, require users to conduct many operations manually.
For most buyers, there probably is no need to go for exotic features.
"Capacity, performance and ease of use are the top three criteria for LAN backup," says Stan Corker, director of removable

storage research at International Data Corp. in San Diego. "If you were talking about backup of desktop devices, then price would be the top criteria. But in LAN backup, you are sharing the cost over a number of users."
In addition to those features, users and analysts agree that users should weigh such factors as the hardware platform, file systems supported, memory requirements and availability of file backup and restoration features.
One rule of thumb, regardless of low- or high-end system, is that most LAN backup software comes bundled with a hardware subsystem that it supports. Some vendors, such as Cheyenne Software, Inc., provide only software to support specific network operating system environments and backup systems.

Industry standards now under development, such as Novell, Inc.'s Storage Management Services, aim to make LAN backup programs independent of network operating systems and backup hardware.
PC vs. server
LAN backup software typically runs on either a workstation or a server attached to storage devices. Each approach has its advantages.
Server-based systems run faster than their workstation counterparts because data is transferred from the server to storage devices over a Small Computer System Interface, rather than over the network. Some advocates also argue they are better able to cope with multiple file formats.

"The best approach is to put the backup software on the file server," says Reijane Huai, vice-president of engineering at Cheyenne Software, based in Roslyn, N.Y. "The file server is designed to support different users through different protocol stacks."
But server-based systems may slow response times and are useless if the server isn't working. If problems occur, the server may have to be brought down. "The biggest problem with server-based backup is that a problem with the backup system can affect server operations and you have to wait until the server is up and running to restore local disks," says Patrick Corrigan of The Corrigan Group, a Sausalito, Calif.-based network consulting firm.
Workstation-based systems

can swing into action if the server goes down, but they are generally slower and may congest the net with traffic shuttled between nodes. However, they allow restoral even when the file server is down.
Dan Strohl, a network administrator at Legal Communications, Ltd., uses a workstation-based system to check for viruses during backup. "It's a bit slower, but if there are any problems, it beeps and I don't run the backup," he says.
For some users, such as Robert Brown, a systems analyst at Eli Lilly & Co. of Indianapolis, the issue is moot. "We have one server dedicated just to backing up files," he says.
While the location of the software is an important factor, net-
(continued on page 38)

(continued from page 37)

work operating system support is equally important.

"The first and most important thing is to make sure it backs up your LAN," says Strohl, who uses Palindrome Corp.'s Network Archivist to back up about 2G bytes of data on a Novell NetWare LAN at Legal Communications, a publishing house in Philadelphia. "If your LAN is NetWare, make sure it is Novell certified and that it will back up all the file rights and bindery info."

By far, LAN backup programs offer the greatest support for NetWare. Only six vendors in the Buyer's Guide do not offer NetWare support, choosing instead to offer products for Microsoft Corp. LAN Manager, IBM LAN Server or other environments.

Delta Microsystems, Inc. and Shany, Inc. both offer LAN backup software for LAN Manager and LAN Server nets, while Dantz Development Corp. offers a product for Apple Computer, Inc. AppleTalk nets. Legato Systems, Inc., Maynard Electronics, Inc. and Sytron Corp. do not offer NetWare support on some of their products.

Colorado Memory Systems, Inc. and EFI Electronics also offer support for Artisoft, Inc.'s LANtastic peer network operating system, while EFI Electronics provides support for Banyan Systems, Inc.'s VINES.

Networks with multiple hardware platforms and operating systems require a backup system to handle a variety of file formats. DOS-only backup programs typically can't handle the longer file names used on Apple's Macintosh. Even when Macintosh or Unix files are backed up, some directory information, such as ownership or security attributes, may be lost. Users with multiple platforms may end up needing more than one backup system.

In the accompanying chart, backup products from Cheyenne Software, Colorado Memory Systems, EFI Electronics, Emeritus Technologies, GigaTrend, Inc., Legato Systems, Novell and Tallgrass Technologies Corp. all offer support for DOS, Macintosh and Unix files.

It's an obvious point, but the backup software also has to be compatible with the backup subsystems. When users buy everything from one vendor, that shouldn't be an issue. But for those that mix and match systems or wish to upgrade their software while maintaining their tape system (usually to preserve their tape libraries), compatibility can pose a problem.

Vendor support is also crucial. "My recommendation is to buy from an integrator," Corrigan says. "If there is a problem, you know who to go to."

Backing up files and directories involves more than just making a mirror image of the disk. Software features such as selective and unattended backup dramatically cut the time users need to spend managing their systems.

Backup options

Selective, or incremental, backup allows users to decide when various files will be saved and to make incremental backups easily. For instance, if you must back up five servers, instead of conducting a full backup once a

the ability to bypass bad sections of tape, but much of the software doesn't take advantage of that capability yet," Corrigan warns.

Compression features are a nice extra that are often tightly integrated with hardware. Because compression can stretch media capacity, it makes it practical to back up on one tape what might ordinarily take two.

With the exception of Cheyenne Software, Delta Microsystems, EFI Electronics, Emerald Systems, Gazelle Systems, Novell and Shany, all vendors in the ac-

Unattended backup is rapidly becoming a standard item for most users.



week, selective backup will allow you to back up every night only the new or altered files. While overall performance is partly a matter of the hardware involved, software plays a key role in reducing the total load of files for backup and, thus, the amount of backup time, by eliminating the need to back up unchanged files. Almost all vendors offer this as a standard feature.

Unattended backup is another important feature and one that is rapidly becoming a standard item for most users. This is partially a hardware issue because it requires that the media selected be large enough so tape swapping isn't necessary.

"When we leave at 5 p.m., we start the backup process, so it's real important to get a lot of data on one cartridge," says Terry Baughman, a senior electrical research and development engineer who uses a system from Emerald Systems Corp. to back up a 34-node NetWare LAN at T.B. Wood's Sons Co., an electrical parts manufacturer in Chambersburg, Pa.

Software comes into play here, too. An unattended backup system has to be capable of handling errors. When a file can't be backed up — perhaps because it is open — it must be reported to the network administrator. Some products, such as Emeritus Technologies' TapeWare or Palindrome's Network Archivist, automatically retry to back up open files at the end of the unattended backup period. Of the products listed in the accompanying chart, only Novell's SBackup doesn't offer automatic backup of multiple files.

Another backup feature in high demand is error correction, but few products today offer the capability. "DAT hardware has

companying chart support compression.

Features that allow administrators to back up remote nodes are also important. Cheyenne, Colorado Memory Systems, Emerald Systems, Maynard Electronics, Novell and Palindrome are a few of the vendors that support backup of remote nodes. Central Point Software, Inc., Distinct Corp., Symantec Corp. and Sytron do not offer this feature.

Central Point Software, however, offers virus detection, and other vendors provide an array of unique features. Colorado Memory Systems offers password protection of files, while Emerald Systems provides a disk groom-

Before cataloging was available, locating files for restoral was extremely difficult.



ing feature to make efficient use of disk space.

Restoral features

While file backup is usually done at leisure, restoration of files is often done in a panic. Though it's called backup software, most users and analysts agree it's the restoral features that are really important.

"The primary thing — and everything else is secondary — is, can I recover data in a timely fashion?" Corrigan says.

All LAN backup programs look and perform well until a problem occurs, which is where most users separate the great performers from the average and poor products, Corrigan adds.

"I don't want to name names, but I know some backup systems that people have been very happy with until it came to a point where they had to recover data," he says. That's when users discovered their systems didn't handle error correction or didn't allow selective restorals.

For the most part, restoral features mirror backup features. Selective, or file-by-file, restoral is simply the converse process of a file-by-file backup and is important for the same reasons. Error handling, verification, compression, and restoral to nodes and other servers are also essentially the same.

In addition, vendors offer support for such common restoral features as DOS restore commands, file cataloging and restoral of selected directories and files.

The key to the whole restoral process, however, is file and data management. While restoral speed will depend greatly on the hardware system, file management can help by making it easy to locate needed files.

File management features are not universally offered by LAN backup software vendors. Some companies that do offer the features are Cheyenne, Emerald Systems, Legato Systems, Palindrome and Tallgrass Technologies. Interestingly, Colorado Memory Systems, Novell and Symantec do not.

File and data management

Cataloging, or maintaining a database of all the files backed up on tape or other storage subsystem, is at the heart of data and file

floor. Now we just punch a few buttons."

Baughman says that before cataloging was available, locating files for restoral was extremely difficult. "It took 20 minutes per tape just to look, and if you didn't know what tape it was on, there were a lot of tapes to go through."

Cataloging enables administrators to locate particular files on tape by file name, file owner, creation date, directory, backup tape or other attributes. Some advanced systems, such as Palindrome's Network Archivist and Emerald Systems' Xpress Librarian, also list historical information showing all of the different versions and revisions of a file — an especially useful feature in archiving.

Sixteen of the vendors in the accompanying chart offer file cataloging, including Central Point Software, Cheyenne Software, Emerald Systems, GigaTrend, Legato Systems and Sytron.

Ultimately, file management begins to affect resource management. "People are looking at file management overall, not just backup and restoral," Corrigan says. "When people are dealing with file management, there is the question, 'How can you get rid of the clutter created by unused files?'"

Archiving and disk grooming are two complementary file management procedures used to preserve important data while freeing up server disk space. Cheyenne Software's ARCserve and Palindrome's Network Archivist support these features. Archiving is similar to backup, but archive copies are intended to last for years and are often necessary to meet legal requirements such as tax record keeping. Archive copies usually include multiple versions of the same files. For example, programmers may want to keep successive revisions of their software available.

"One of the big things here is storing of CAD drawings," Baughman explains. "We use the tape to store old drawing revisions, and it really helps out that we probably have 800M bytes worth of archive files."

Disk grooming and file migration rely on information in the tape catalog to clear unused files off server disks. Server disk space costs 100 to 1,000 times as much as tape, so it makes sense to remove data that isn't used. Grooming uses essentially two user-defined parameters — the dormancy period, or how long it has been since a file was last accessed, and the number of copies desired as backups on tape.

"Anything more than seven months old, we just back it up and

(continued on page 47)

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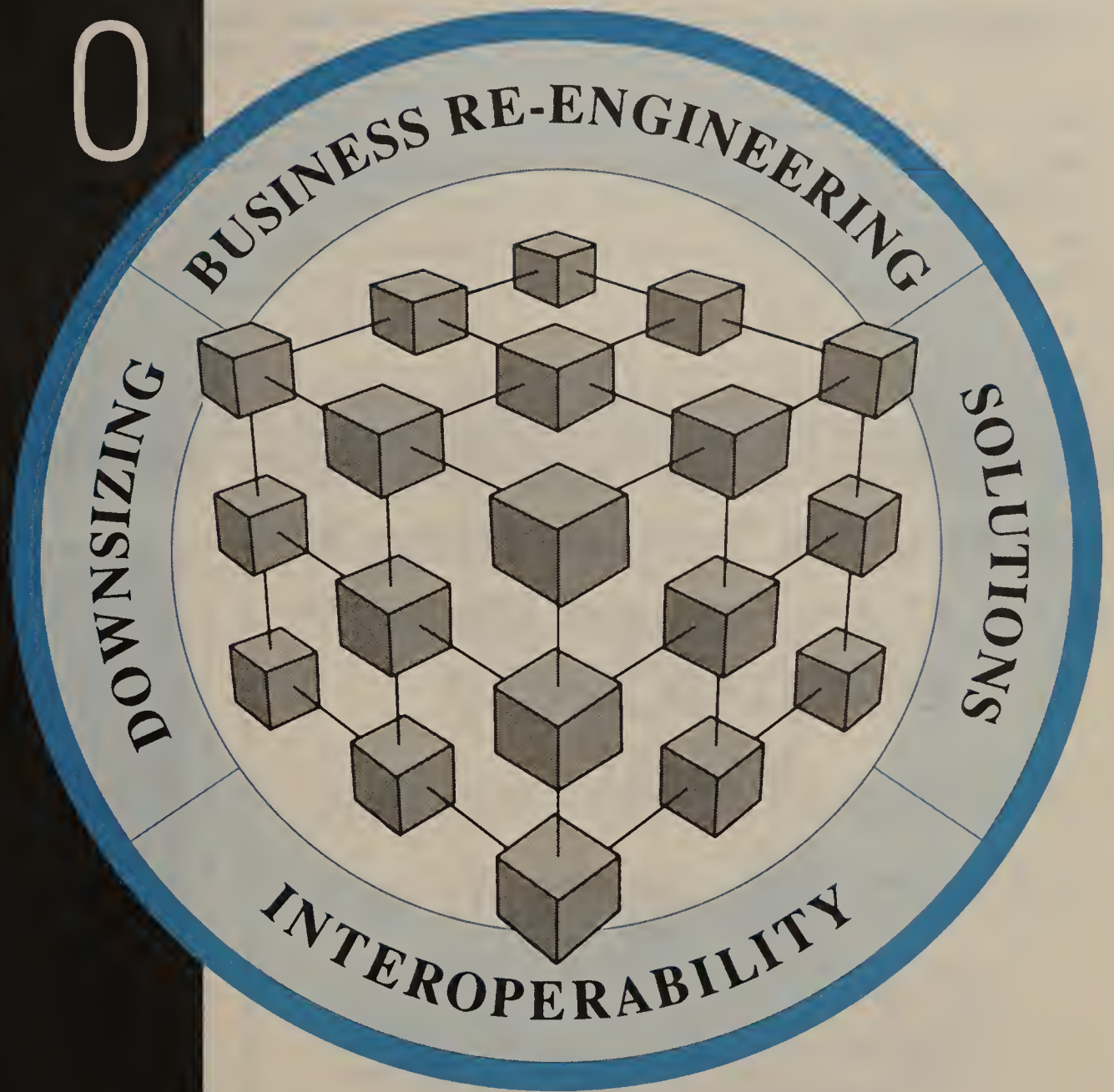
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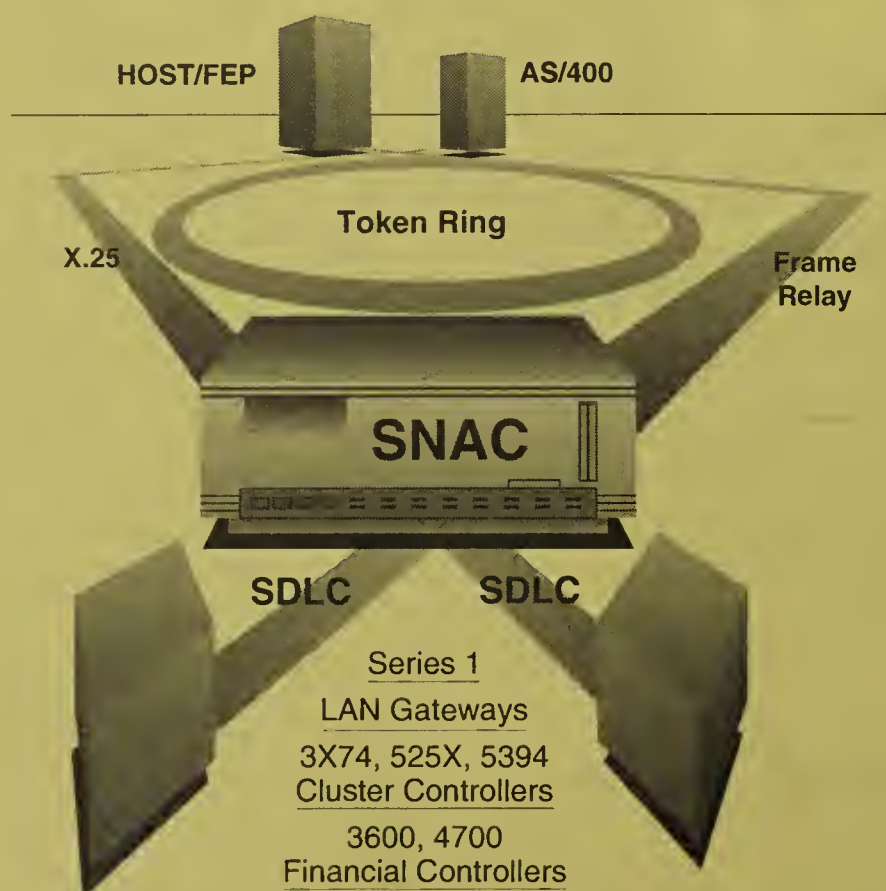
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9	10	11	12	13	14	15	16
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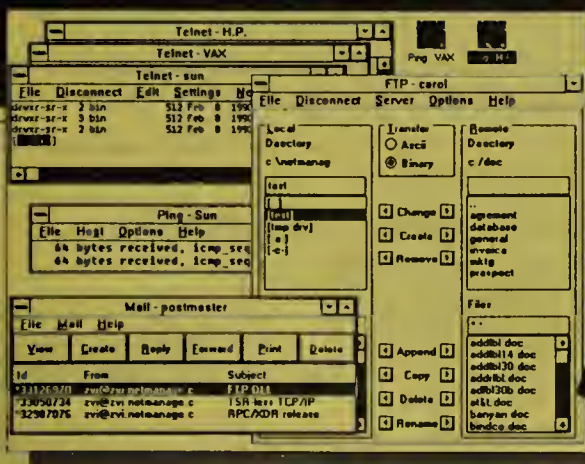
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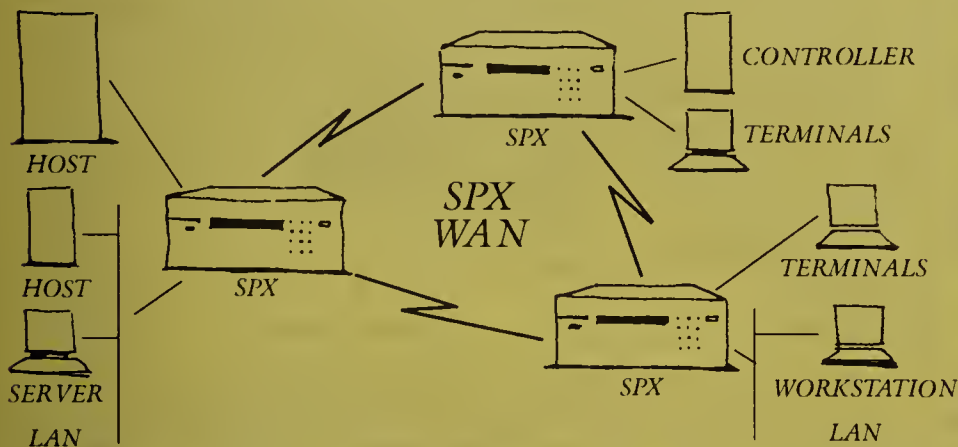
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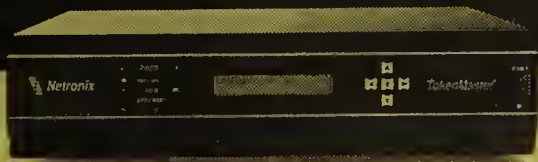
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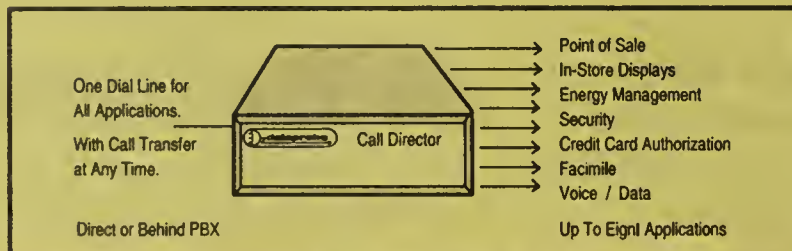
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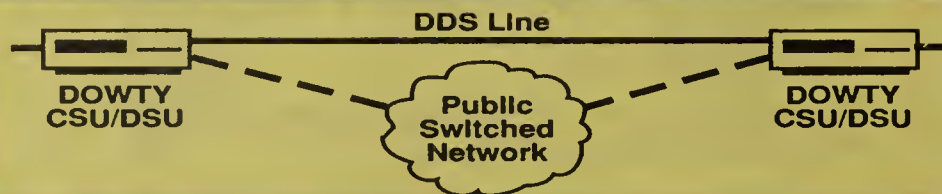
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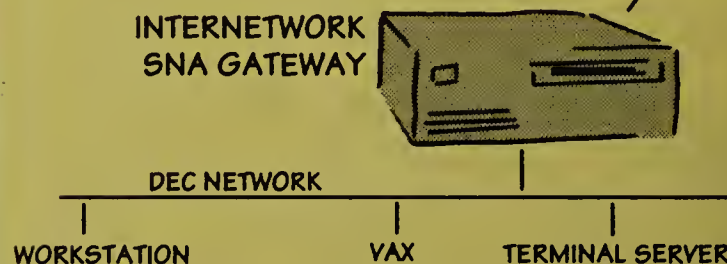
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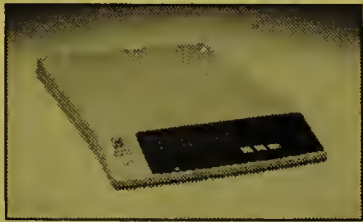
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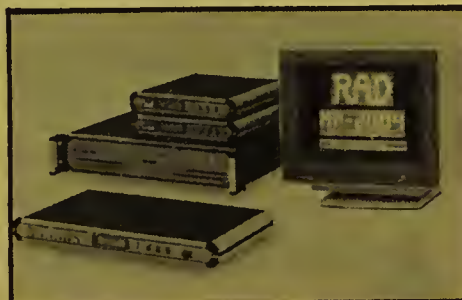
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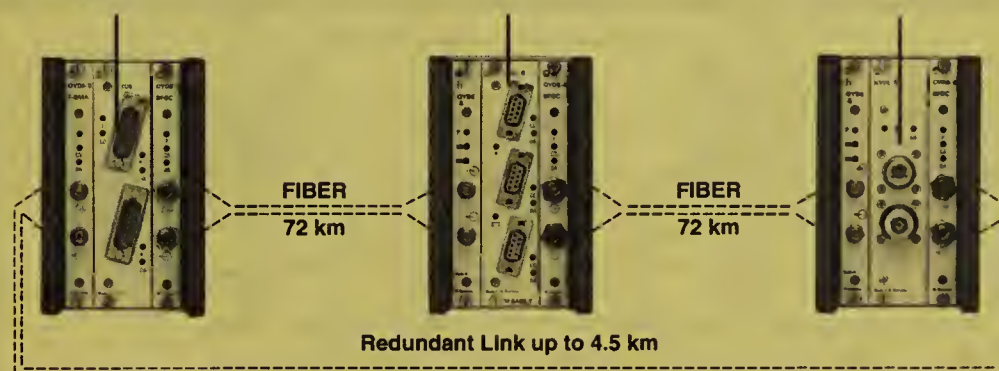
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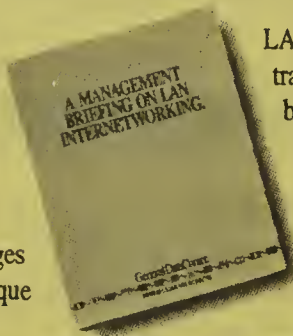
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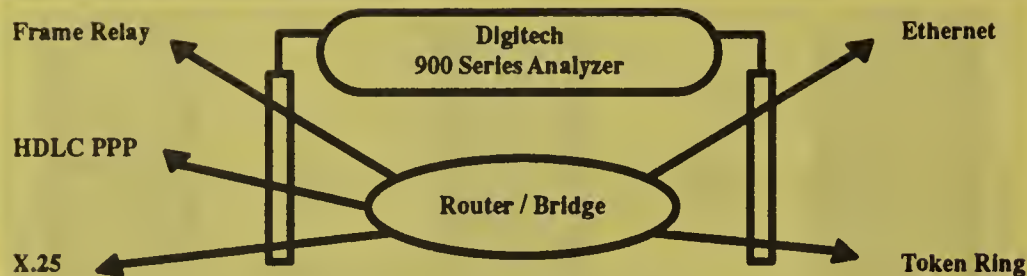
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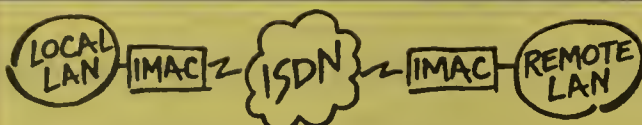
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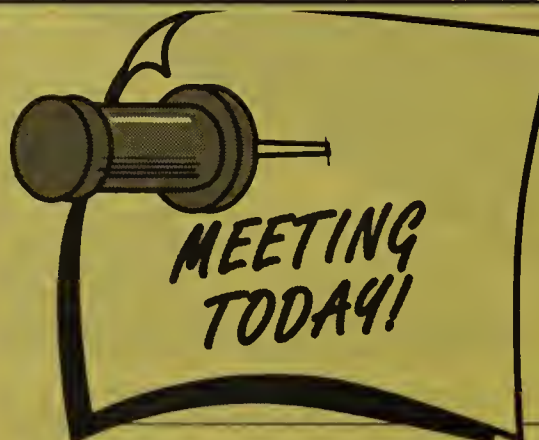


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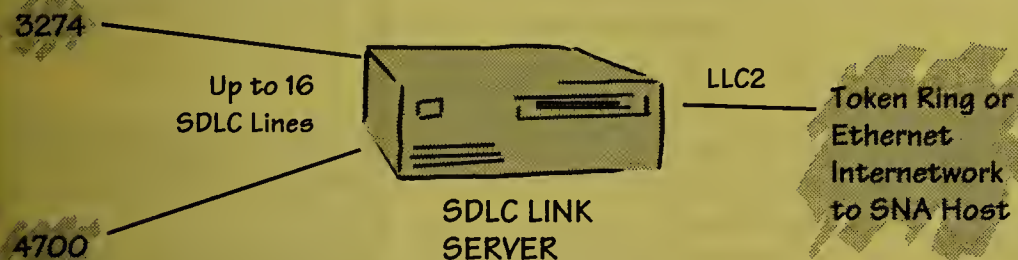
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LAN backup gets smart

continued from page 38

get out of here," Baughman says.

Effective file management also requires a good tape rotation system. Tape rotation was once a simple matter of keeping two complete sets of backup tapes — one with the current backup and one with the previous backup. Since then, more complex schemes using incremental backups have evolved. These help eliminate the need to backup the same unchanged files repeatedly, saving both time and tape space. Some vendors even assert that the combination of file management and tape rotation make full backups obsolete.

Finally, file management has a security component. Backed up files need to be given the same level of security they get while

“The only thing you can do with SMS is back up an 80386 file server.”

▲▲▲

they are on the LAN. A few systems will do tape encryption and DAT locking to prevent unauthorized restores.

“People spend a lot of time on securing files and then back up to tape and put that in their drawer,” Strohl says. “I’ve seen several high-security places with tapes in the middle of the MIS guy’s office.”

Standardization

Standards are the key to unbundling backup software from specific hardware. One of the most important standards efforts is Novell’s Storage Management Services (SMS).

Unveiled last year, SMS is a standard interface between storage devices, NetWare and NetWare Target Service Agents running on client machines. Target Service Agents handle file transfer from the client workstation to another machine. SMS should make it easier for backup software vendors to handle new NetWare releases.

SMS will also provide a standard format for data interchange between tape systems and eventually grow to include data management features. For example, using the migration application program interface (API), backup software will be used to move a file off-line but will keep a record

of it in the file allocation table.

Corrigan says Novell proposed SMS to simplify life for tape equipment vendors that had to rewrite their backup software everytime Novell issued a new release of NetWare.

“With SMS, equipment vendors will interface to SMS APIs,” Corrigan says. “When the changes are made, everybody doesn’t have to scramble to get their software up-to-date.”

But SMS has gotten mixed reviews. “It is a good architecture, a good concept,” Huai says. “It will remove a lot of the burden from backup system vendors.”

But others say the reality of SMS is far from what it should be. “The concept is fine — we have used it for five years — but the only thing you can do with SMS is back up an 80386 file server,” says Rod Christensen of Emeritus Technologies. “In the real world, there are not only 80386s, but 80286s and PCs with local storage.”

The beef with some vendors is that SMS does not totally shield backup software vendors from NetWare, and some vendors contend SMS adds overhead processing to their operations.

What vendors want is for Novell to offer a single set of APIs that developers can support to access NetWare file types, and backup vendors will design the software to access the data.

One vendor, a member of the Quarter Inch Cartridge standards committee, says the committee’s members provide haphazard support for SMS. He said vendors will likely ship support for SMS alongside other solutions that offer greater functionality.

But because Novell controls the name spaces provided by NetWare, SMS may be the only way to get at all the different file types of a NetWare server. Of those companies listed in the Buyer’s Guide, nine respondents support Novell’s SMS, including Cheyenne Software, Gazelle Systems and SitBack Technologies, Inc.

Backing up in the future

The future of backup software will be driven by the growth of LANs. Greater on-line storage requirements, more mission-critical applications, more heterogeneous environments and more users will place new demands on backup systems — and on network administrators.

Mainframe technology, for problems such as file management and near-line storage, will migrate downward to help solve some of these problems.

But no matter how intelligent and sophisticated backup systems become, it will be the procedures administrators follow that will determine the success of their backup strategies. ■

ATM switch opens LAN vistas

continued from page 1

the computer from the speed of the network,” said Audrey MacLean, Adaptive president and chief executive officer, referring to the performance degradation powerful workstations experience when attached to large LANs.

“This is the first in a new class of networking products to break through the bandwidth, building and systems management limitation of current networks.”

The ATMX is implemented in a network much like a LAN hub. Workstations and internetworking devices connect directly to the switch, while the switches themselves are linked to form a 1.2G bit/sec work group, building or campuswide backbone.

Non-ATM devices, such as existing hubs, and token-ring, Ethernet and FDDI LANs, can be connected to an ATMX backbone through a bridge/router with an ATM interface, essentially turning those devices into ATM gateways.

Retix’s RouterXchange 7000, for example, has an ATM interface that uses Adaptive’s ATM chip technology.

ATMX is designed to address the segmentation, congestion and node relocation problems inherent in LANs.

Segmentation can increase cross-LAN traffic, which can lead to congestion. Congestion can degrade the performance of a network, while frequent moves, adds and changes force users to redesign nets to route data to a node’s new location.

“Most of our internetworks today are in crisis,” said John McQuillan, president of McQuil-

lan Consulting in Cambridge, Mass. “Our solutions have become our problems. We’ve outgrown our designs in both scale and complexity.”

Because ATM is a technology developed for both LANs and public carrier networks, ATMX allows users to scale their LANs to very large networks without segmenting LANs with bridges or routers.

ATMX overcomes concerns about congestion, giving each attached device a dedicated 100M bit/sec point-to-point pipe for net access.

To accommodate moves, adds and changes, ATMX creates virtual LANs. Virtual LANs are multiple LAN segments that can be logically and physically defined and maintained throughout a local- or wide-area ATM network.

Virtual LANs eliminate the need to reassign network addresses after nodes are physically moved. Workstations assigned to virtual LANs remain part of the subnetwork regardless of their physical location, Adaptive said.

ATMX’s impact will most likely be felt in the FDDI arena.

Beta user Bear, Stearns used FDDI to support trading applications. But the 100M bit/sec bandwidth of FDDI, coupled with the segmentation of FDDI LANs, made the network “unwieldy,” said Jeff Marshall, managing director of communications at the



Audrey MacLean

investment firm.

“We’re highly segmented to the point where power is diminished,” Marshall said. “Unless we get integrated quickly, we’ll have to throttle back. That’s not fair to the trading applications.”

ATMX will allow Bear, Stearns to improve the performance of its LAN servers and “get some MIPS back” for applications processing, Marshall said.

The ATMX is priced at \$45,000 in an entry-level configuration of the chassis, power supply, switching module and one six-port attachment module. Additional cards can be purchased for \$26,000.

Adaptive last week also introduced the ATMX Adapter Card for Sun Microsystems, Inc. SPARCstations. The \$4,500 card provides Sun workstation users with a direct connection to the ATMX switch and access to resources on the ATM LAN.

The card has not been tested to run with any other switches, but Adaptive plans to do so.

The company also announced a management station that monitors and controls the ATMX switch and any attached third-party SNMP device.

It runs on a Sun SPARCstation with an Open Software Foundation, Inc. Motif user interface that displays an ATMX network topology of switches and virtual LANs. Adaptive has not finalized pricing for the management station.

All products will be available in September. ■

Letters

continued from page 31

Authors’ response: PostScript printers do not make up “the majority of the world’s shared printers.” A recent study by International Data Corp. found that only 24% of shared printers — and 21% of all installed printers — in the U.S. in 1991 supported Adobe Systems, Inc.’s PostScript page description language. In contrast, 60% of all shared printers used Hewlett-Packard Co.’s Printer Control Language (PCL).

As the Macintosh is outnumbered on the typical network, so are its printers. While Macintosh users can easily share PostScript printers among themselves or with DOS, Windows and Unix workstations (using AppleTalk), sharing less expensive and more numerous PCL-based printers using net-

work operating system vendors’ print services is an impossible dream for Macintosh users today.

Also, you say shared PostScript printers don’t need to be managed by a “middleman,” such as a network operating system. Actually, Macintosh networks today manage shared PostScript printers through AppleTalk and print management utilities, such as AppleShare’s Print Monitor.

AppleTalk lets managers name PostScript printers and include them in logical domains, or zones. PrintMonitor organizes print jobs in manageable queues that let users see what jobs are left, reprioritize or cancel jobs. Those two pieces of software perform the basic management services administrators expect from network operating systems.

Some of the major network operating systems actually do

manage PostScript printers on AppleTalk nets, but they don’t do the translation that would let Macintoshes print to PCL-based printers or enable personal computers to send print jobs to PostScript printers attached to Macintoshes. For example, Novell, Inc. NetWare users can share a PostScript printer attached via Novell’s Internetwork Packet Exchange (IPX) but not via AppleTalk.

This tangled mess — like so many others in the network operating system arena — could be resolved by using one standard industrywide, as you suggest. However, we have to agree with The Burton Group’s Craig Burton that integration will never be achieved that way. “That would be akin to having everyone join the same religion to have world peace,” he said. “As long as you join my religion, it is OK, but I’m not joining yours.” ■



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Hermes to deliver Windows tools

continued from page 1

ware on appropriate local-area network clients or send a software update to nearly any workstation, as long as it is prepared to receive them.

In contrast, Microsoft's Hermes works exclusively with Windows to give managers more information about their users' environments and more control over software installations and user configurations.

To be managed, users must log onto a domain — a logical group of servers — controlled by a Hermes server.

Hermes uses its own agent to gather information about workstations and execute installations. The agent can be installed in the background on any number of users' machines, allowing managers to execute real-time installations or queries one machine at a time.

For more automatic control, managers can store the agent at the server. When a user logs onto a LAN Manager for NT server, the agent automatically executes any waiting information queries or installation instructions and then erases itself.

Installation instructions can be packaged with if-then queries to ensure a machine meets certain criteria, such as a minimum amount of random-access memory, before installation.

The first release of Hermes will also be able to limit how many and which users can employ applications stored at the LAN Manager for NT server. Using this capability, managers can also set up a profile that will allow a user's desktop applications to migrate to any workstation on the network that the user logs onto.

Future versions of Hermes will offer a more sophisticated metering server that will be able to control application usage over the network regardless of whether

Microsoft touts net role of Cairo

SAN FRANCISCO — Microsoft Corp. Vice-president Jim Allchin last week told developers that network functions will come as naturally as local functions under a future object-oriented version of Microsoft Windows, code-named Cairo.

That's because Windows Cairo will offer directory services built directly into the file system of every Windows workstation on the network. While other vendors such as Novell, Inc. and Banyan Systems, Inc. are creating visibly separate server-based directory products, Microsoft plans to merge Windows' local and remote directories so they are indistinguishable.

"Users will never know if a file is local or remote," Allchin said. The same will be true of any other resource on a network of Windows machines, he said.

Windows Cairo will rely on Windows Open Services Architecture to include other vendors' directory services and, therefore, other network operating services in user environments.

Allchin outlined only one of the many

features of Windows discussed during the Win32 Professional Developers Conference here this week.

The company brought together 4,000 developers to talk about its Windows NT operating system, which will ship by year end for less than \$500.

Microsoft also announced that Windows NT's remote procedure call (RPC) will be compatible with RPC servers based on the Open Software Foundation, Inc.'s Distributed Computing Environment (DCE). This will allow developers to build applications that can span DCE-compatible platforms.

Microsoft publicly acknowledged the existence of its Windows for Workgroups product and said it would be out in early 1993 for less than \$300. The company offered few specifics but said the product will include peer-to-peer networking and an electronic mail client, which works with the company's Messaging API. It will also support IBM LAN Manager and Novell NetWare LAN clients.

— Margie Wylie

the program is stored at a server or workstation. Any application written to the Software Publishers Association's software metering application program interface (API) will work with the Hermes metering server.

Microsoft will also offer APIs that will allow third parties to extend Hermes functionality or integrate their applications more tightly with Hermes.

"There are several third parties out there doing bits and pieces, but customers were complaining that there was no single solution [for Windows management]," said Richard Barth, product manager for

Microsoft's network business unit. When Hermes ships, those vendors can integrate their tools with Hermes, he said.

Hermes is still in prototype and has not been priced. Its first release will manage only Windows environments, but future releases are expected to work with other types of nodes, such as Apple Computer, Inc. Macintoshes. Hermes will work on Novell, Inc. NetWare and Banyan Systems, Inc. networks that have one Windows NT personal computer running LAN Manager for NT, but Microsoft is considering porting the utility to run on those networks natively. □

E-mail group to develop common API

continued from page 4

Wash., a common API will help ensure interoperability of E-mail applications and engines, adding "the fewer APIs [vendors] need to support, the easier it is to build gateways and E-mail applications."

The standard API will also make it easier for users to develop their own mail-enabled applications, observers said.

XAPIA will kick off its standards effort at a technical subcommittee meeting in Dallas on July 21-22, said Janie Chang, public relations committee chairwoman at XAPIA and a product manager at OSIware, Inc., a Vancouver vendor of X.400-based messaging systems.

The group will try to define a "simple send" API, a standard way for applications to send messages through any mail engine, Chang said. This API would be a component of a more robust standard messaging API. "This is a pilot test to see how well [XAPIA] can get together" on defining a common API, she said.

The next step will be to get user input on a broader API that would address other functions, including receiving a message and attaching a file to a message, Chang said. The discussion will be held Aug. 12 in

Seattle at a meeting of the Electronic Mail Association (EMA), an Arlington, Va.-based group of E-mail users and vendors. At the EMA's annual meeting in San Francisco on Oct. 25, XAPIA will hold a tutorial on messaging APIs and present a straw man candidate for a common messaging API, said Ed Owens, XAPIA chairman.

According to Suzan Fine, MAPI product manager at Microsoft, XAPIA has responded as Microsoft hoped it would. "The user outcry over APIs sent XAPIA a pretty powerful message," she said.

Gursharan Sidhu, chairman of the Vendor Independent Messaging (VIM) inter-

face group, said VIM welcomes "the opportunity to work with XAPIA on making a vendor-independent simple send API available." The VIM standard, which is backed by Apple Computer, Inc., Borland International, Inc., Lotus Development Corp. and Novell, Inc., is a competing messaging API to MAPI.

Judith Rosall, electronic messaging program director at International Data Corp., a Framingham, Mass., market research firm, applauded the XAPIA initiative. "It will accelerate the mail-enabling application effort by eliminating confusion over multiple APIs," she said. □

IBM product helps automate help desks

continued from page 4

IBM said TRW Financial Systems, Inc., General Electric Co., Digital Equipment Corp., AT&T, Sprint Corp. and MCI have expressed interest in developing interfaces. However, none of the vendors confirmed that they were working on an interface.

Mike Morin, supervisor of data center operations for Pratt & Whitney, a division of United Technologies Corp. in East Hartford, Conn., has PMB installed and said his

company was working with TRW to get an interface.

"We haven't used the PMB to communicate with another vendor yet," Morin said. "We're hoping IBM arranges something with DEC or TRW."

For now, United Technologies is using the ECI module to dial up IBM's service center. Morin said PMB has been a useful tool for his help desk, which handles about 150,000 calls annually.

IBM's ECI module to its NSS is priced at \$10,000. PMB software will be priced at \$15,000. Both will be available Sept. 25. □

Net/Command now automated

continued from page 2

ware that work with BBI-3. The software will be announced this week at the Enterprise Expo in Chicago.

New Net/Command

Net/Command consists of a Sun Microsystems, Inc. workstation and software that can collect alarms from more than 20 vendors' net management systems. It

adding the ability for Net/Command to respond to faults without the need for operator intervention."

Analysts said the automation features will help Boole & Babbage stay in step with competitors such as Candle Corp. and Legent Corp. while filling a gaping hole in the product's previous capabilities.

"Adding automation features makes this a stronger workstation platform," said Fred Joy, a senior research analyst with the

Analysts said the automation features will help Boole & Babbage stay in step with competitors.



enables users to manage multi-vendor nets through a single console.

"Today, Net/Command can monitor problems in the network but can't [automatically] act on them," said Saverio Merlo, senior vice-president of marketing at Boole & Babbage. "We will be

META Group in Westport, Conn.

Analysts also applauded the planned introduction of BBI-3, which is the underlying software that Boole & Babbage will use to build distributed systems and net management applications.

BBI-3 provides a graphical user interface, security and distributed computing capabilities as well as communications support for applications written on top of it.

According to Boole & Babbage, BBI-3 will let users separate the user interface, management application logic and data, and distribute them throughout an enterprise, while providing a single point of control.

Analysts at the META Group said BBI-3 will let Boole & Babbage set up client/server applications with specialized servers for collection, processing and presentation of systems and net management information.

Along with BBI-3, Boole & Babbage will announce MV Manager for MVS, the first client/server application available on the platform. MV Manager monitors MVS applications and provides information on problems such as link outages and machine failures.

The company's new Net/Avail software will also utilize the BBI-3 software. Net/Avail monitors components in an SNA net and can track such events as logical and physical unit outages.

"For now, we are focusing our efforts in the IBM arena, but all of our BBI products will eventually support multivendor systems and networks," Merlo said.

The new version of Net/Command is expected to be available later this year. Pricing has not been disclosed. MV Manager will be available July 15, with pricing starting at \$18,000. Net/Avail will be available later this summer and will start at \$22,000. **Z**

Report details public outages

continued from page 2

"sensitive" by the FCC. A sensitive site might include a military installation or airport. If the information is extrapolated for the entire year, the NRC report indicates that there could be as many as 20 central office switch outages this year.

The TCA report was compiled from data submitted to the FCC by local carriers on a quarterly basis in Automated Reporting Management Information System (AR-MIS) reports. It focused only on outages caused by local switch failures. The NRC report identified 19 outages affecting 50,000 or more lines from April through June that were caused by other problems (see graphic, this page).

Barletta questioned any comparison, saying the studies looked at different carriers. "Quite frankly, I don't think it's relevant. I don't think things are getting worse," he said.

The NRC study compiled data from the regional Bell holding companies and all independent carriers. TCA also included data from all RBHCs plus the major independents — Centel Corp., GTE Telephone Co., Southern New England Telephone Co. and the United Telephone companies. The TCA report excludes two carriers — Centel Corp. and Roches-

ter Telephone Corp. — and the many small independents.

However, observers said it's unlikely any independent smaller than those in the TCA report would have switches that could affect 50,000 lines.

Jeff Linder, counsel for TCA, had a mixed reaction to the report. "Having five local switch outages in one quarter is a distinct increase from the experience of last year. But I think the [FCC] and the NRC are looking closely at the problem." He said more information must be collected to determine trends.

Local and long-distance outages reported from April through June	
Outages affecting 50,000 or more lines or critical sites*	
Number of outages	Cause of outage
5	Local switch failure
6	Interexchange carrier or local tandem switch failure
1	General failure in network
9	Cable cut
3	Signaling System 7 failure
Total outages: 24 (Five additional outages reported in this category were not described.)	
Outages affecting between 30,000 and 50,000 lines	
Number of outages	Cause of outage
5	Local switch failure
2	General failure in network
1	Cable cut
Total outages: 8	
*Critical sites include military installations, airports and nuclear power plants.	
SOURCE: FCC'S NETWORK RELIABILITY COUNCIL GRAPHIC BY SUSAN J. CHAMPENY	

TCA and others have pressed the FCC to step up efforts to protect users from outages. But despite strong user protests, the FCC decided in February to require carriers to report only outages that affect at least 50,000 lines for 30 minutes or more. The report must be made within 90 minutes. Previously, carriers were not required to report outages in a real-time manner and, before the second quarter of 1991, did not have to report switch outages at all.

The NRC is monitoring outage data voluntarily submitted by the carriers on outages affecting fewer than 50,000 lines to determine whether more stringent reporting requirements are needed. But users said they are dismayed the FCC would go through such a laborious process to decide something as simple as requiring carriers to report outages affecting 30,000 or more lines.

Twenty-nine NRC-reported outages fall under the FCC's current reporting requirement. Eight others would have gone unreported because they affected between 30,000 and 50,000 lines. The report did not name carriers experiencing outages.

The most common reasons for outages were local switch problems and cable cuts. Other reasons included Signaling System 7 problems, overloads due to natural disasters, call-in promotions and even riots in Los Angeles. **Z**

Debating NSF plan to upgrade

continued from page 2

by two carriers to spur cost competition and innovation. The plan called for a third party, a kind of routing administrator, to direct traffic between the two carriers.

But NSF is now convinced that there will be competition in 155M bit/sec Synchronous Optical Network Optical Carrier-3 services in two years and intends to award a five-year contract to a single provider, which will be called the Very High Speed Backbone Network Services Provider (vBNS).

According to the draft solicitation, the future network must be capable of routing Internet Protocol and Connectionless Network Protocol (CLNP) packets. The vBNS provider must also furnish videoconferencing service.

Routing Authority

NSF anticipates making a second contract award to a so-called Network Access Point (NAP) Manager/Routing Authority. The Routing Authority would build an unspecified number of NAPs consisting of router servers linked by Fiber Distributed Data Interface rings.

For a fee paid to the Routing Authority, any carrier or any re-

gional or federal network operating at least at T-1 speed and handling both IP and CLNP data could attach to the Internet backbone through a NAP. The carriers would also have to support videoconferencing.

The NSFNET redesign revolves around the government's Acceptable Use Policy (AUP), which says the federal government should subsidize transport of data pertaining to research and education, but not commercial traffic.

NSF said the vBNS provider can transport commercial data if it does not impact the 155M bit/sec speed or quality of service provided for AUP-compliant data, NSFNET program director George Strawn said.

The NAPs are designed to route research and education traffic to the vBNS backbone and commercial traffic elsewhere. "This will permit, for example, two attached networks to exchange network traffic without violating the AUPs of any other attached network," NSF said in its draft solicitation.

NSF has described the NAPs as "a conceptual evolution" of the Commercial Internet Exchange

nodes used to carry commercial data over the Internet today.

Gordon Cook, president of Cook Network Consultants in Ewing, N.J., said the NSF decision to allow the new backbone service provider to carry commercial data replicates the same conditions that caused some concern about ANS. Some carriers contend that ANS has an unfair market advantage because it can carry commercial data over a network subsidized by federal funds.

Fine-tuning needed

But ANS, the incumbent NSFNET carrier, is not completely satisfied with the NSF proposal either. Al Weis, president and chief executive officer of ANS, said he has reservations about the proposal that he will discuss fully once his company's criticism of the NSF plan is filed.

Weis said, "NSF knows there's fine-tuning needed. They're struggling with this. Balancing all the interests and the goals is a very difficult task."

Weis said ANS has not decided whether to bid on the backbone service or routing authority part of the new contract. NSF expects it will spend \$10 million per year on both. **Z**

NETWORK WORLD

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ATM threatens to usurp FDDI

continued from page 1

egate FDDI into a niche.

"I think there's still going to be a healthy FDDI market because there's a lot of bandwidth need today that FDDI is perfectly valid for," he said. "But ATM will definitely limit the growth of FDDI, especially if it develops at its current pace."

However, Karen Leonard, marketing manager for high-speed networks at Digital Equipment Corp. in Merrimack, N.H., cited FDDI's industry entrenchment as a mitigating factor.

"FDDI is stable and is here today with 70 or more vendors delivering products and solutions," she pointed out. "ATM is an evolving standard with some significant issues to overcome in relation to interoperability. Digital anticipates there will be two high-speed networks in the future in much the same way there are two dominant mid-speed networks today."

Although the 100M bit/sec FDDI could satisfy some token-ring and Ethernet users looking for solutions to their increasingly demanding LAN needs, ATM is beginning to loom as a better alternative.

Besides the fact that their top speeds are worlds apart — 20M to 30M bit/sec average throughput with FDDI vs. up to 195M bit/sec with ATM — the basic network architectures are designed for different times.

"There's no good way to do multimedia on a shared network like FDDI," Nolle said. "That's just a fact of life."

The switched-based ATM technology, on the other hand, can simultaneously support voice,

data, video and imaging applications.

"The credible demands for high bandwidth are video-oriented. So if we're moving away from data as the principal bandwidth factor, why would we want to stay with a data-arbitrated media strategy?" Nolle asked. "The answer is, we wouldn't. It doesn't make sense."

Timing factor

The issue also appears to be one of timing. Because FDDI has been limping through the standards process and development of FDDI-2 is at a virtual standstill, ATM has been able to catch up.

"The installed base of FDDI is not large enough to constitute much of an impediment to rejecting the whole technology," Nolle said. "If the FDDI people could have advanced their cause a little bit, it would have been much more difficult for ATM to grab the attention of users."

Some view the recent bickering over which technology to use in order to support FDDI over copper wire as a typical example of FDDI proponents playing into the hands of the ATM crowd.

The fact that an IBM-led group developed its own standard for running FDDI over shielded twisted pair instead of joining forces with the vendors working within ANSI contributed to the delay in arriving at a standard.

The ANSI standard, which will address transmitting FDDI traffic over both shielded and unshielded twisted pair, is still nine to 12 months away from completion.

"Had the FDDI vendors made the decision about which technol-

ogy to use in the copper standard a year ago instead of just last month, there would probably be products out today," Howard explained. "The vendors missed a big window of opportunity [to get a jump on ATM] by fighting about what the right engineering proposal should be."

The same type of problem is hounding the development of FDDI-2, which is being advanced by an ANSI working group as a next-generation technology to handle voice, data and video needs — the very strength of ATM.

Since the effort to develop FDDI-2 is languishing in ANSI, the promise of using ATM to achieve the same ends received a significant boost.

"Because ATM technology is designed to meet the isochronous needs of users and will be available around the same time that the demand for those types of applications increases, FDDI-2 won't be needed," Howard said.

Why ATM?

Despite its apparent momentum, questions about ATM remain. While it looks good on paper, users are still unsure of its capabilities or how it will affect network operations.

"Users can jump on the ATM bandwagon right now because no one really knows what it is," said Laura Capaldini, principal of NorthPoint Consulting in Reston, Va. "It's easy to say, 'ATM? Oh yeah. I think it's great.'"

And even though the number of users requiring the power of ATM is small today, it appears that industry is moving to embrace the technology at break-neck speed.

"There seems to be such unan-

imous agreement that ATM is the direction that end users, [customer premises equipment] vendors and carriers want to be moving, I have to think it's going to happen very fast," Capaldini said. "ATM to the desktop is definitely going to happen. The question is how soon."

Some observers believe it will happen quickly. "It's very possible that there'll be a credible ATM-to-the-desktop product available by the end of this year," Nolle said.

Adaptive Corp., for example, announced an ATM-based switch for LAN use just last week (see "ATM switch opens new LAN vistas," page 1). And many vendors in the LAN hub camp have promised ATM products by year end or early 1993 ("Hub vendors ready transition to ATM," *NW*, May 4; and "Hub vendors vary in market strategies," *NW*, May 11).

Planning ahead

Some analysts believe that users planning for the future should consider preparing for ATM now.

"If you're wiring today for a five- to seven-year lifetime, you'd better star-wire to a hub, and you'd better plan to carry ATM on that wire," Nolle said.

"There's no question that ATM will dominate early 21st century networking," he added.

Howard pointed out that it is really not an either-or situation. "People making long-term decisions for a backbone should consider ATM along with FDDI," he said.

"If in the next year or two you need a backbone, you can put in FDDI," he continued. "You could then deploy ATM in a campus environment and run it alongside your FDDI backbone." □

User resolves AppleTalk woes

continued from page 1

them from getting bogged down with extraneous information."

Time Magazine's headquarters here houses eight popular magazines, including *Fortune*, *Life*, *Money*, *People*, *Sports Illustrated* and *Time*.

The administrative arm of the company runs on token-ring local-area networks running IBM's Systems Network Architecture and Novell, Inc.'s Internetwork Packet Exchange (IPX) protocols. The editorial side comprises predominantly Macintosh workstations attached to Ethernet LANs. Altogether, the company has more than 500 Macintoshes.

Time Magazine was looking to interconnect these divergent nets and enable the formerly isolated departments to gain selective access to a few shared facilities, including a corporatewide elec-

tronic mail system.

But AppleTalk LANs have inherent functions that result in excessive overhead when the LANs are interconnected, said Bill Lofmark, Time Magazine's network facilities engineer.

One problem is AppleTalk's Routing Table Maintenance Protocol (RTMP), a transport-layer protocol that creates and maintains routing tables on each router. All of the routers use RTMP to broadcast routing tables to one another, even though some routers need never communicate with LANs attached to other routers.

The second function involves AppleTalk's Zone Information Protocol (ZIP), which maintains an internetwork mapping of zone names and network numbers. AppleTalk zones group resources on a departmental or logical basis.

When a routing table entry without corresponding zone information is detected, such as when a new LAN is added, Apple-

Talk attempts to find the zone data through a ZIP Query.

Because the size of the ZIP Reply increases in direct proportion to the number of zones that comprise the net, ZIP Queries can mean excessive broadcast traffic.

To avoid such problems, Time Magazine implemented AppleTalk filtering mechanisms on the 12 Wellfleet Communications, Inc. bridge/routers it installed at headquarters here.

The filters eliminate "chooser nightmare" — a condition where every Macintosh user is presented with a list of all the zones throughout the internet upon logging onto a workstation.

With the filters, users are given access only to the networks, or zones, that are pertinent to their needs, thereby eliminating the need to sift through other zones.

The zone filtering also improves network security because once a device on which confidential data resides is placed within a

restricted zone, that information is automatically safeguarded from unauthorized access.

The filters also serve as an access control mechanism, said Time Magazine's Crimando. They can prevent *Life* magazine resources, for example, from being advertised to a router supporting *Time* magazine LANs, thereby barring users from accessing confidential data.

"[Routers] have the potential to permit promiscuous access to all information," Crimando said. "The filters let us organize the communications in a way that makes sense and also preserves the integrity of each user's data."

Filtering enables Time Magazine to divide departments into distinct zones separated by some shared zones. In that fashion, the company is able to let departments share nonsensitive data by storing it on the shared servers while keeping confidential data on servers in restricted zones. □

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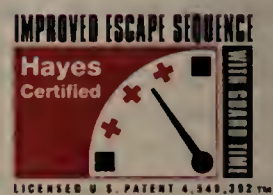
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